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ABSTRACT

This document contains four papers (and an introduction by William Wilhelm) on teaching "soft" skills in business education programs. "The Skill Building Challenge: Preparing a Bridge for the Workforce Skills Gap" (Sheila M. Smith) examines the following topics: the workforce skills gap; the importance of academic and behavioral skills; and public policy solutions to the workforce skills gap (the Secretary's Commission on Achieving Necessary Skills, Goals 2000, the Workforce Investment Act, and tech prep). "Research on Workplace Skills Employers Want" (William J. Wilhelm) looks at ways of identifying the basic skills and "soft" skills wanted by employers and selected findings of such studies. "Strategies and Resources to Develop Workplace Skills" (Linda F. Szul) describes the following strategies and resources for developing "soft" skills: coaching; designing and creating a World Wide Web page; career portfolios; job-shadowing experiences; newsletters; senior projects; closure activities; station activities; domain projects; portfolios; videotapes and observations; interviews; case studies; classroom resources; professional organizations; and student organizations. The paper "21st Century Assessment for the Workplace" (Joyce Logan) covers the following topics: the areas of focus and strategies of norm-referenced and criterion-reference tests; standards-based education; assessment perspectives; research implications of current directions in assessment; emerging assessment formats (performance tasks, portfolios, open-ended questions); the effectiveness of standards-based assessment; and the assessment implications of workplace "soft" skills. All papers contain substantial bibliographies. (MN)

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MEETING THE DEMAND: TEACHING "SOFT" SKILLS

by

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Preface

Research shows that affective skills, such as the ability to work with others, to communicate effectively, to demonstrate initiative and self-direction, to solve problems, and to generally demonstrate a positive work ethic, are the skills most demanded by employers of today's entry-level employees. However, it is this same set of skills that industry and political leaders continue to claim our schools are not adequately teaching the youth of America. A gap between those affective or "soft" skills demanded by today's employers and those skills provided by our educational institutions seems to exist.

What exactly is this "gap"? Who says it exists? What proof is available? What can be done about it in the business education classroom? This publication addresses these pressing questions. In no way is this publication presented as a panacea to satisfy this demand or solve this problem. It is, however, a sincere attempt to address the issue in a logical and factual manner. It is a start. All readers who have ideas and methods of instruction that address this issue are encouraged to contact me with your ideas and insights. This is an evolving area of utmost importance.

I express my sincere appreciation and thanks to all who contributed to this publication. The chapter authors, the Delta Pi Epsilon Publications Committee members and staff have made this publication possible. I express special thanks to Helene Zimmerman for her Herculean efforts for the final edits.

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Introduction

by
William Wilhelm

Throughout America in recent years, business, labor, and educational leaders have been coming together to articulate educational goals that reflect this convergence. Many groups have undertaken the task of identifying the skills and competencies that are required of entry-level workers. These initiatives include among others: the Secretary's Commission on Achieving Necessary Skills, 1991; the National Council on Education Standards and Testing (NCEST), 1992; the National Educational Goals Panel, 1992; the Future of the American Workforce Conference, 1994; the National Education Standards and Improvement Council, 1994; the National Skills Standards Board, 1994; the New Standards Applied Learning Framework Project, 1994; and Vice President Gore's Twenty-First Century Skills for Twenty-First Century Jobs, 1999. The identified skills and competencies are frequently termed "universal" in that they are intended to afford all entry-level workers personal and financial success, regardless of the industry or workplace setting. Policy makers believe these skills and competencies also help ensure that young people contribute to American society as conscientious and active citizens.

Despite extensive effort from the education profession to teach the identified skills and competencies, employers continue to assert that far too many high school graduates and many college graduates still do not possess the skills necessary to contribute productively in their jobs without extensive employer training. Politicians echo these sentiments in their rhetoric. Literature reports the fact that it is the nontechnical work behaviors of most entry-level employees that do not meet employers' needs.

This publication will address the nontechnical affective skills needed to develop productive employees for the business world. This discussion, however, must be presented within the context of all of the identified entry-level skills and competencies demanded by employers in today's workplace. Business educators can ill afford attempts to specialize instructional delivery only for the affective skills and to disregard the cognitive and technical skills. Logic dictates, of course, that they all must be taught in a manner that will best prepare the learner how to utilize them all in a demanding work environment.

Chapter 1, Skill Building Challenge by Sheil M. Smith, analyzes the existence of the alleged "skills gap," differentiates between academic and behavioral skills, and discusses public policies that offer solutions to the problem. The research that leads to the identification of accepted entry-level skills and competencies is discussed in Chapter 2, Research on Workplace Skills Employers Want. It examines a series of research studies that substantiate the relevance of previously identified skills as they relate to specific geographic and demographic characteristics and industry types. These studies demonstrate the weight of importance that employers place on the affective "soft skills." Chapter 3, Strategies and Resources to Devlop Workplace Skills by Linda Szul, identifies several approaches to teaching and assessing the acquisition of workplace skills. This chapter points to the logic of authentic learning methods and authentic assessment as a means to successfully teach both cognitive and affective skills in a holistic manner, pragmatically approaching the manner in which skills are utilized in the workplace. The implications of assessment are the main theme in Chapter 4, 21st Century Assessment for the Workplace by Joyce Logan. The chapter begins with a review of school accountability and assessment practices and how school reform and curricular redesign influence them. The discussion then moves to results from brain research, a refocusing of cognitive psychology on the complexity of thinking, and how this newly gained knowledge affects assessment practices. The chapter concludes with a summary of new directions for assessment and accountability measures and what these mean for the development of workplace skills.

Chapter 1

The Skill Building Challenge: Preparing a Bridge for the Workforce Skills Gap

by
Sheila M. Smith

> *"Education is our passport to the future,*
> *for tomorrow belongs to the people who prepare for it today."*
> ***—Malcolm X***

One of the primary benefits of education is personal empowerment. Empowered people create social and economic development and stability. The greatest development and stability occurs when the largest numbers of individuals are able to meet changing social and economic expectations. Global competition, ethnic diversification, and technological innovations have created new expectations for the 21st century United States workforce. The rapid occurrence of these new expectations has created a disparity between workforce skills required and skills available (Cappelli, 1992a; Judy & D'Amico, 1998; SCANS, 1999). This difference has created a problem of preparedness and proficiency of the U.S. workforce – the workforce skills gap.

The Workforce Skills Gap

Compulsory education to age 16 was sufficiently effective in keeping pace with social and economic expectations for much of the 20th century (Smith, 1993). The current concern about skills began with the federal report *A Nation at Risk* (U. S. National Commission on Excellence in Education, 1983) that documented the poor academic performance of U.S. students compared to our competitor nations. Other studies soon focused on the disconnection between skills and performance. The Commission on the Skills of the American Workforce (1990) report, America's Choice: High Skills or Low Wages, and the report from the Office of Technical Assessment (1990), Worker Training, argued that higher levels of skills in the workforce were necessary in order to develop new, more productive systems of work organization to compete successfully with other nations. The Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) was established in 1990 to identify the common skills that the workforce as a whole required of employees. In its various reports, the Commission has argued forcefully that new types of organizations and new arrangements for organizing work - employee empowerment, teams, and new work technologies - require new skills and a higher level of existing skills from workers. In the SCANS 2000 report

(1999), the message was good jobs will increasingly depend on people who can put knowledge to work. However, SCANS 2000 reported that more than half of all young adults do not possess the knowledge required to acquire and maintain a good job.
Companies of all sizes throughout the U.S. are confronted with the decline in employees' basic skills (reading and writing) as jobs become more technical. Employers increasingly need workers with analytical skills, independent judgment, and the ability to work closely with others in complex operations (Szabo, 1993). A number of factors contribute to the workforce skills gap. Streck (1992) stated that the workforce skills gap is influenced by the declining skills of graduates coming out of U. S. high schools, the increasing number of immigrants for whom English is a second language, and the greater sophistication of jobs as the economy has become information-based rather than manufacturing-based.

Areas of expertise are under major reconfiguration. Occupations are undergoing immense reconstruction; the effect is increasing the gap between those who have the skills and those who do not (Salzman, 1998). According to the 1999 Hudson Institute study, Workforce 2020 (Judy & D'Amico, 1998), the number of low-skilled jobs have declined, and the number of jobs requiring higher math, language, and reasoning skills are increasing. Jobs have moved away from blue-collar, production-oriented, and mindless labor toward white-collar, computer-based, and information service work (Cappelli, Bassi, Katz, Knoke, Osterman, & Useem, 1997; Judy & D'Amico, 1998). The distribution of jobs has shifted toward positions that require higher skill levels. According to the National Center on the Educational Quality of the Workforce (1995) survey, 56 percent of the 3,347 corporate respondents reported an increase in skill requirements among production or support personnel.

The U.S. is moving towards a knowledge-based workforce. New jobs require the ability to interpret as well as absorb complex information. Individuals are required to consistently perform at the highest levels of the cognitive domain. Systematic and abstract knowledge is a necessity for successful career and academic performance. The ability to extract and apply new information from ever-changing experiences appears to be one of the most important skills an employee will need in order to effectively confront new technological advancements (Bedore & O'Brien, 1991). Although there are many positives resulting from the advent of the "Information Age," one of the negatives is the widening gap it has created between those who have the skills to access, understand, and utilize information, and those who do not. The increase in the volume and availability of information requires advanced skills for processing information; these advanced skills can be acquired only through higher levels of education and workforce training. Accelerated change has led to higher expectations and higher levels of personal disenfranchisement for many adults in the workforce.

Less than 25 years ago, an individual with a college degree in any subject was highly marketable, and a person with a high school diploma could locate a good paying job without postsecondary education. Today, employers seek graduates, college and high school, with demonstrated abilities and specialized education credentials. Many fields require greater credentials than in the past, more education, and more licensing. According to the report, 21st Century Skills for 21st Century Jobs (1999), the fastest growing jobs require additional education and training, with the greatest increases in technology-oriented fields. New jobs will require more than a high school education, yet only 23 percent of all Americans age 25 and older have a college degree. Approximately 30 percent have some college education, 22 percent have finished high school but did not go on to college, and 24 percent do not have a high school diploma. Credentials have an increased value in today's technology-oriented workforce. Increased credential requirements have caused U.S. companies to experience an increasing gap between the skills employers want in their employees and the skills those employees bring to their jobs.

Skills: Academic and Behavioral

The National Association of Manufacturers (NAM) in its 1997 survey of 4,500 manufacturers stated 88 percent are experiencing a shortage of qualified workers, 63 percent indicated improvements are needed in workers' basic skills, 60 percent reported workers lack math skills, and 55 percent stated workers are deficient in basic writing and comprehension skills. Over 60 percent of the NAM companies surveyed reported that their current workforce possesses poor job attitudes (timeliness, absenteeism, staying at work all day). In addition, workers have serious deficiencies in basic math, written language, and problem-solving skills.

Smith, Jones, and Lane (1997) conducted an extensive study to assess employee workforce competencies. Instrumentation involved the use of 317 behavioral statements categorized according to the eight SCANS concentration areas to measure the minimum proficiency needed to perform acceptable work. Study results indicated that employers perceived a lack of desired competencies in their present work force for both high school and college graduates. Regardless of the size of the nine different industries, a consistent skills gap existed between the current and desired work competencies.

Academic skills. Deficient education or lack of quality education is one of the main reasons adults do not possess the skills needed to obtain employment or to perform satisfactorily on the job. The 21st Century Skills for 21st Century Jobs (1999) report stated many adult Americans lack even basic skills. More than one in five U.S. citizens demonstrate literacy and numerical skills at or below the 5th grade level while another 25-28 percent demonstrate skills between the 6th and 8th grade levels. The 1999 Hudson Institute study, *Workforce 2020* (Judy & D'Amico, 1998), stated one of the reasons companies do not hire job candidates is inadequate writing or verbal skills. The average manufacturer rejects five out of every six job applicants; one-fourth of them lack the skills to fill out an application form. A survey of 200 companies by Olsten Corporation (1996), a temporary help firm, found 78 percent of the corporate respondents reported writing as the skill that needed the most improvement. Improvement of academic skills would reduce illiteracy problems in the workforce.

Computer technology skills are now an essential component of academic training. However, 78 percent of the companies in the 1996 Olsten Corporation survey reported inadequate basic computer skills among their employees. Unfortunately, the gap between computer skills required and skills possessed has increased. Only 49 percent of the companies surveyed in the 1991 Olsten Corporation survey reported computer skill deficiencies among employees; however by 1996, 69 percent of the companies surveyed reported employees were not adequately trained to handle new computer technologies introduced in the workforce.

Behavioral skills. In addition to the traditional concerns about the quality of educational attainment, many employers report a lack of employees with good behavioral skills (Cappelli, 1992b; Kelly, 1992). Behavioral skills have been defined as listening and interpersonal skills as well as work habits and attitudes. When asked to identify the primary sources of job performance problems, employers single out the behavioral skills of their employees.

Cappelli (1992b) stated that among the high school graduate population workforce productivity problems were primarily caused by lack of behavioral skills, not academic skills. Zemsky (1994) stated that young people lack discipline; they expect to be catered to; they do not want to do the dirty jobs; and they do not respect authority. Cappelli and Iannozzi (1995) reported that employers listed work attitudes, such as punctuality, following instructions, and showing a genuine concern for task outcome, as the primary causes of poor job performance. More than 75 percent of the corporate respondents in the 1996 Olsten Corporation's survey listed employees' lack of interpersonal communication skills as a critical deficiency.

Smith, Jones, and Lane (1997) found a need for improvement in academic skills; however, employers reported a greater need for improvement in behavioral skills among both high school and college prepared entry-level employees. Employers in the study perceived a greater gap between desired behavioral skills and current skill level than the gap between desired academic skills and current skill level.

According to Cappelli et al. (1997) employers stated that only 50 percent of recent high school graduate applicants are qualified for entry-level positions. Cappelli et al. found behavioral skills as the most important deficiency among entry-level applicants. Employers reported interpersonal skills and poor attitudes toward work as the most serious deficiencies.

Consequently, the nation's standard of living and its capacity to sustain itself as an economic power is increasingly at risk of losing strength. Robert Reich, Secretary of Labor, whose book, *The Work of Nations*, advanced the most persuasive form of this argument. Reich (1991) supplied the best summation of what would become the winning argument: "As almost every factor of production, money, technology, factories, and equipment moves effortlessly across borders, the very idea of an American economy is becoming meaningless, as are the notions of an American corporation, American capital, American products, and American technology. A similar transformation is affecting every other nation, some faster and more profoundly than others...So who is us?" (p. 8). The answer to the question of "who is us?" may be found within the U.S. workforce. Reich sees education and worker training as key to raising U.S. productivity, economic growth, and living standards. The challenge facing the U.S. is creating skill enhancement strategies that will elevate the potential value citizens can add to the international economy.

Solutions to the Workforce Skills Gap – Public Policies

Plugging the workforce skills gap has been a prominent theme of the U.S. government. Achieving this goal is essential to keeping U.S. companies competitive with leading firms overseas and necessary to keep and create good jobs in this country. Federal, state, and local policy makers have increasingly directed attention and resources to developing strategies to prepare students for the workforce (Lynn & Wills, 1994). Many recent public policies have begun to address the workforce skills gap issue.

One broad recommendation that will bring education, business, and government together is to construct programs that will benefit all the critical players, especially the students. In order to create the link needed to connect the workforce and the classroom, teachers, administrators, business owners, and government officials must get involved in work-based learning program design and delivery.

Work-based learning programs connect work to the classroom; the curriculum is relevant and applicable to the real world of work. The term "work-based learning" is new, but it is based on the old cooperative education (co-op) concept. While there is no single model of cooperative education, an essential federal report entitled "The Secretary's Commission on Achieving Necessary Skills (SCANS)," and key legislation such as Goals 2000, Workforce Investment Act, and Tech-Prep encourages the creation of school and employer partnerships.

SCANS. In 1999 the Secretary's Commission on Achieving Necessary Skills (SCANS) report (U.S. Department of Labor, 1999) was given four directives by the U.S. Secretary of Labor. Specifically, the Commission was asked to: (a) define the skills needed for employment, (b) propose acceptable levels of proficiency, (c) suggest effective ways to assess proficiency, and (d) develop a dissemination strategy for the nation's schools, businesses, and homes. In accordance with the first directive, the Commission identified five competencies: (a) resources, (b) interpersonal skills, (c) information, (d) systems, and (e) technology. The five competencies are based on a three-part foundation: (a) basic skills, (b) higher order thinking skills, and (c) diligent application of personal qualities. These eight requirements are vital in the preparation of work- and college-bound students. SCANS 2000 stated that the eight requirements are not reflective of a person's technical expertise but represent the behavioral skills that today's employers seek in tomorrow's employees.

Goals 2000. In conjunction with the National Education Goals Panel, the U.S. Departments of Education and Labor have collaborated to implement Goals 2000: Educate America Act of 1994. The objective is to form a partnership between the Federal Government and states and communities to improve schools. According to Richard Riley (1995), Secretary of Education, Goals 2000 is a landmark school reform effort establishing a framework for excellence in U. S. education. Within its framework for excellence, Goals 2000: (a) sets challenging academic standards, (b) asks states to develop their own comprehensive education reforms, and (c) encourages parent and community involvement. A few of the objectives of Goals 2000 are:

- All children in the U.S. will enter school ready to learn.
- A high school completion rate of 90 percent.
- Partnerships with parents, school, and communities that promote the benefits of academic, social, and emotional student development.
- Every school will teach critical thinking skills, so that students may engage in lifelong learning opportunities and responsible citizenship.
- Preparation of highly-talented teaching professionals.

WIA. The Workforce Investment Act of 1998 (WIA), formerly the Job Training Partnership Act of 1982, is a workforce development system designed to meet organizational and individual needs in a changing society. The primary focus of the WIA is to help individuals acquire work-ready skills. The new system is based on the one-stop career center concept that will furnish core services. The core services include comprehensive assessments, individual employment portfolios, counseling, and vocational services. Training services directly connected to employment opportunities include career skills training, entrepreneurial training, skills upgrading, and adult literacy activities. Currently, more than 800 one-stop career centers serve as a link to employers. Companies can provide information about job openings and skill needs. Fulfilling the education/training needs of employees that lead to meeting employers' needs for skilled workers is the primary objective of WIA (Pantazis, 1999).

Tech-Prep. The Tech-Prep model has become a major factor in the effort to improve education in the U.S. The model emphasizes the importance of giving students opportunities through career pathways that link applied, hands-on approaches to learning academic concepts. The 1998 amendments of the Carl D. Perkins Vocational and Technical Education Act, known as Perkins III, reauthorized Tech-Prep so that efforts can continue in the promotion of work-based learning. Tech-Prep promotes reform, innovation, and continuous improvement in vocational and technical education to ensure that students acquire the knowledge they need to meet challenging state academic standards and industry-recognized skill standards.

Clearly, as knowledge of the gap between skills and jobs becomes more widely understood, an emerging consensus holds that education, business, and government must work together to eliminate the skill level variance. In addition to the specified public policies, Lynn and Wills (1994) suggest building a national support structure to develop materials for use in the classroom and at the workforce. Curriculum frameworks need to contain national skill standards that link the classroom to the workforce, resulting in skill acquisition transferable to a variety of occupational clusters. Lynn and Wills (1994) challenge educators to take the learning seriously by focusing on workforce requirements. Each student needs to learn several categories of skills within a hierarchy in order to be successful in the workforce. These skills must include learning how to apply what is imparted in the classroom to a work setting. Other skill training must concentrate on cognitive abilities (e.g., quantitative and abstract reasoning), workforce basic skills, cross-functional skills (e.g., information gathering, communication, problem analysis, organizing and planning, coordinating with others), occupation specific knowledge, and personal qualities (such as acting responsibly). These various categories of requirements are important in high-performance work settings and increasingly considered essential skills that add value and encourage productivity within the U.S. economy.

The overall focus for future education and training programs must be on a comprehensive set of skills. The skills set must incorporate job-specific proficiencies, basic academic skills (math and writing), and behavioral skills (critical thinking and interpersonal relationships) to meet the challenges of the new technology-oriented, high-performance work environments. Comprehensive education and training programs that promote employee growth and development provide an important opportunity to regain an U.S. economic competitiveness while enhancing the quality of workers' lives. This opportunity must not be lost in the gap.

Summary

Work environments have evolved into high-tech, high-performance entities that demand employees who can read, write, speak, think, and interact with others. The nature of work has changed and the nature of these changes will necessitate quality training and education for the current and future workforce. Emphasis on education and training as a key to economic growth represents an important opportunity for education, business, and government to work together to provide the skills necessary to enable the U.S. to remain a top competitor worldwide.

To meet the skill-building challenge, the U.S. needs to move from policy to implementation of a joint collaborative effort of education, business, and government to create comprehensive programs. Two major issues must be addressed by this collective group: 1) establishment of a knowledge-based workforce by concentrating on academic skills, as well as behavioral skill development and 2) work-based learning programs that combine work and the classroom.

A report by the National Institute for Literacy (1999) entitled "Skills for a New Century: A Blueprint for Lifelong Learning" outlined four key workforce learning goals to move America forward. They are:

1. Deliver education, training, and learning that are tied to high standards, lead to useful credentials, and meet labor market needs.

2. Improve access to financial resources for lifetime learning for all Americans, including those in low-wage jobs.

3. Promote learning at a time and place and in a manner that meet workers' needs and interest.

4. Increase awareness and motivation to participate in education, training, and learning (2).

Actively involved partnerships will help ensure the delivery of high quality, relevant education that concentrates on workforce-applicable academic and behavioral skills. Strong collaborative efforts will produce positive economic and social outcomes that will benefit workers, educational institutions, employers, and the U.S. government. Productive partnerships between educators, employers, and government agencies result in better-educated adults and a more proficient workforce. An educated, productive workforce creates significant resolutions that will bridge the workforce skills gap.

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Chapter 2

Research on Workplace Skills Employers Want

by
William J. Wilhelm

The general concept of identifying specific skills and standards for jobs is not new to the education scene. For example, apprenticeships have operated for thousands of years. Six decades ago, the Apprenticeship Training Service, known as the Bureau of Apprenticeship and Training, registered standards for 22 occupations, mostly in the building trades area. Additionally, numerous professions have long had skill certification and licensing programs in place. But a series of initiatives over the last 15 years have helped forge today's consensus on the need to clarify and clearly communicate defined standards that apply to the full range of workers (National Skills Standards Board [NSSB], 1996). These initiatives have generated considerable discourse and subsequent research aimed at determining the relevance and profundity of identified skills and competencies, and to determine measurements of proficiency.

This chapter examines the influences leading to the identification of universally accepted workplace skills and competencies, i.e., those skills and competencies that all organizations desire in their employees, regardless of industry type. The first section traces the history of influences prompting research initiatives investigating the skills employers want high school graduates to possess upon graduation and subsequent entry into the workforce. Next, it examines a series of research studies that attempt to substantiate the relevance of previously identified skills as they relate to specific geographic and demographic characteristics and industry types. The chapter concludes with a summarization of the implications of the current research.

Identification of the Basic Skills That Employers Want

Following The National Commission on Excellence in Education's landmark report, *A Nation at Risk* (1983), the Reagan Administration documented the expected shortage of skilled workers in the future in a report, Workforce 2000. In 1988, the William T. Grant Foundation, which specializes in the study of issues relating to youth, released a groundbreaking report, *The Forgotten Half*, which focused on the social consequences of neglecting the education of the large proportion of all students in the United States who do not go on to college. In another major report entitled *America's Choice: High Skills or Low Wages!* (Commission on the Skills of the American Workforce, 1990), the Commission on the Skills of the American Workforce warned of a steeply declining standard of living in the U.S. workforce if the nation failed to prepare its workers and businesses for competition in the global economy. In 1991, President Bush and Education Secretary Lamar Alexander's education strategy, America 2000, urged business and labor to adopt a strategy to establish job-related (and industry-specific) skill standards. "As an outgrowth of the initiative, the Departments of Labor and Education funded pilot projects to develop standards in a range of industrial and occupational areas" (NSSB, 1996, p. 8).

Anthony P. Carnevale served as project director and principal investigator for the American Society for Training and Development (ASTD) study began in 1986 and underwritten by the U.S. Department of Labor. The findings, published in *Workplace Basics: The Essential Skills Employers Want*, (Carnevale, Gainer and Meltzer, 1990) identified, in addition to reading, writing, and computation, other skills that employers considered as "basic" to success in the workplace. These workplace basic skills were categorized into seven skill groups:

1. Influence: Organizational effectiveness and leadership. Employers need employees who understand their organization's purpose and goals, who assume responsibility willingly, and who can motivate coworkers to exemplary performance.

2. Group effectiveness: Interpersonal skills, negotiation, and teamwork. The use of teams in the workplace has been linked to higher productivity, product quality and quality-of-work life. But teamwork requires strong interpersonal skills and the ability to negotiate, diffuse conflict, and understand others.

3. Personal management: Self-esteem, goal setting/motivation, and personal and career development. Employees with strong self-images take pride in their work and feel comfortable setting and striving for ambitious goals. As they contribute to organizational success, they build strong personal career histories and expand their personal horizons.

4. Adaptability: Creative thinking and problem solving. The ability to recognize and define problems, invent and implement solutions, and track and evaluate results is a key personal and organizational skill. Breaking out of the box of narrow linear thinking and seeing connections among seemingly unrelated ideas promote the innovation and adaptability of organizational success.

5. Communication: Listening and oral communication. It is through listening and speaking that people interact most frequently; effective communication is central to the successful operation of a competitive venture. Communications skills are second only to job knowledge in promoting workplace success. While public speaking may be included in some academic curricula, typically no formal training in listening is offered.

6. Competence: Reading, writing and computation. The basic academic skills of reading, writing, and computation have long been revered as the keys to success, but in reality in the past many workers could succeed because of "a strong back and willing hands." But today, a strong work ethic will not overcome illiteracy or innumeracy. Workers at all levels must have the basic academic skills to function adequately in today's computerized and decentralized work environment.

7. The foundation: Learning to learn. This is the most basic of all skills and is the key to future success. Equipped with the skill of knowing how to learn, an individual can achieve competency in the other workplace skills that add value to the organization and enable personal growth and career development. Global competition and technological advancements will require perpetual learning throughout a career. (Carnevale, et al., 1990; Clagett, 1997).

The Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) undertook a second major study. This commission, composed of representatives from business, industry, labor, education, and government, spent 12 months talking to business owners, public employers, managers, union officials, and on-the-line workers in stores, offices, factories, and government offices across the country. Findings of the Commission were published in a series of reports beginning with *What Work Requires of Schools: A SCANS Report for America 2000* (1991). This report, which detailed 36 skills and competencies described as workplace know how, centered around: (a) 20 competencies listed under 5 categories: resource management, interpersonal abilities, information management, systems understanding, and technological abilities; and (b) 17 foundation skills listed under 3 categories: basic reading, writing, computation and communication skills, thinking skills, and personal qualities (SCANS, 1991, xvii-xviii). These skills and competencies are contained in Table 1a (SCANS Report: Three-Part Foundation Skills), and Table 1b (SCANS Report: Five Competencies).

Table 1a
SCANS Report: Three-Part Foundation Skills

1. Basic Skills

Reading - locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.

Writing - communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.

Arithmetic/Mathematics - performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.

continued

Listening - receives, attends to, interprets, and responds to verbal messages and other cues.

Speaking - organizes ideas and communicates orally.

2. *Thinking Skills*

Creative Thinking - generates new ideas.

Decision-Making - specific goals and constraints, generate alternatives, consider risks, and evaluate and choose best alternative.

Problem Solving - recognizes problems; devises and implements a plan of action.

Seeing Things in the Mind's Eye - organizes and processes symbols, pictures, objects, and other information.

Knowing How to Learn - uses efficient learning techniques to acquire and apply new knowledge and skills.

Reasoning - discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

3. *Personal Qualities*

Responsibility - exerts a high level of effort and perseveres towards goal attainment.

Self-Esteem - believes in own self-worth and maintains a positive self-view

Sociability - demonstrates understanding, friendliness, adaptability, empathy and politeness in group settings.

Self-Management - assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.

Integrity/Honesty - chooses ethical courses of action.

Source: What Work Requires of Schools (1991), A SCANS Report for America 2000, U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, D.C. 20210

Table 1b
SCANS Report: Five Competencies

1. *Resources*

Time - selects goal-relevant activities, ranks them, allocates time, and prepares and follows schedules.

Money - uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives.

Materials and Facilities - acquires, stores, allocates and uses materials or space efficiently.

Human Resources - assesses skills and distributes work accordingly, evaluates performance and provides feedback.

continued

2. *Interpersonal*

Participates as a Member of a Team - contributes to group effort.

Teaches Others New Skills - helps others learn needed knowledge and skills

Serves Clients/Customers - works to satisfy customer's expectations.

Exercises Leadership - communicates ideas to justify position, persuade and convince others, responsibly challenges existing procedures and policies.

Negotiates - work toward agreements involving exchange of resources, resolves divergent interests.

Works with Diversity - works well with men and women from diverse backgrounds.

3. *Information*

Acquires and Uses Information - identifies a need for data

Organizes and Maintains Information - organizes, processes, and maintains written or computerized records and other forms of information in a systematic fashion.

Interprets and Communicates Information - selects and analyzes information and communicates the results to others.

Uses Computers to Process Information - employs computers to acquire, organize, analyze, and communicate information.

4. *Systems*

Understands Systems - knows how social, organizational, and technological systems work and operates effectively with them.

Monitors and Corrects Performance - distinguishes trends, predicts impacts on system operations, diagnoses systems' performance and corrects malfunctions.

Improves or Designs Systems - suggests modifications to existing systems and develops new or alternative systems to improve performance.

5. *Technology*

Selects Technology - chooses procedures, tools or equipment including computers and related technologies.

Applies Technology to Tasks - understands overall intent and proper procedures for setup and operation of equipment.

Maintains and Troubleshoots Equipment - prevents, identifies, or solves problems with equipment, including, computers and other technologies.

Source: What Work Requires of Schools (1991), A SCANS Report for America 2000, U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, D.C. 20210

Findings in the SCANS report have been widely accepted by business and industry as necessary for success in the high performance workplace (Bernstein, 1992; Dawson, 1993; Harris, 1996; Lotito, 1992; McKenna, 1991, 1992; Packer, 1992; Wilhelm, 1998). To a large degree, these findings have also been accepted by educators, (Braun, 1996; Elmore, 1996; Frederiksen & Collins, 1996; Grimes, 1994; Hofstrand, 1996; Lesgold, 1996; Murnane, 1997; Harvey, 1998). There has not been universal acceptance in educational and governmental circles for all of the SCANS concepts, however. John Bishop (1996) stated:

> The **Nation at Risk** (National Commission on Excellence in Education, 1983) report recommendation that all students take a course in computers recognized the need for including applied technology in the curriculum. Somehow, however, geography, a subject that is not taught in most jobs, has displaced computers on the National Governor's Association's approved list of five core subjects. Art and music have also been added to the list. Computer studies has not. Although the education reform movement marches under a different banner of economic renewal, it is in danger of being captured by advocates for traditional subjects, such as geography, art, and music, that have little role in improving the nation's productivity or preparing young people for work. The SCANS's proposal to teach budgeting, scheduling, computers, and technology in school was not well received in much of the educational establishment. There is a danger that the emerging system of national assessments in a limited number of academic and aesthetic subjects may discourage students from studying subjects such as computers, business, electronics, and construction that enhance productivity on a job and may encourage students to focus instead on aesthetic subjects that do not. The forgotten half would rise again. After studying hard in school, they still would not have developed the skills necessary to gain high-paying jobs (p. 112).

Identification of the "Soft Skills" That Employers Want

Despite the acceptance of these skills and competencies by employer groups, these same groups continue to express dissatisfaction with job applicants. The dissatisfaction expressed is not on the basis of applicants' technical abilities but rather because of the competencies in other areas (Alpern 1997; Murnane and Levy 1996). The skills most frequently mentioned are knowing how to learn; competence in reading, writing, and computation; effective listening and oral communication skills; adaptability through creative thinking and problem solving; personal management with strong self-esteem and initiative; interpersonal skills; the ability to work in teams or groups; leadership effectiveness; and basic technology skills (Imel 1999; Clagett 1997; McNabb 1997; Murnanae and Levy 1996; Oliver et al. 1997).

These "soft skills" are emphasized in Twenty-First Century Skills for Twenty-First Century Jobs (1999). In addition to technical skills, the report also points up the importance of basic skills, organizational skills, and company-specific skills necessary for employees to successfully function in the changing work environment. This changing work environment stems from the fact that "new forms of workplace organizations and management are beginning to replace hierarchical organizations, chain-of-command communications, as well as narrow, repetitive jobs with little or no worker discretion. Team-based workplaces are decentralized; 'flatter' organizations with cross-functional groups are replacing old, rigid, 'stovepipe' organizations (Twenty-First Century Skills for Twenty-First Century Jobs, 1999, p. 3). The skills described in the report are similar to but less detailed than the skill descriptions in the SCANS reports.

Murnane and Levy (1997) analyzed two U.S. Department of Labor surveys that assessed the basic computational and literacy skills of high school seniors. Each survey then followed the young people over time as some went to college and others didn't. When the young people reached their mid-20s, Murnane and Levy collected information on the jobs they held and the income they earned. Their analysis revealed that the growth in earnings, when adjusted for the basic skills a student knew in high school, "half of the growth in the men's college wage premium and all of the growth in the women's college wage premium are eliminated" (Murnane & Levy, 1997, p. 36). The results meant that high-wage employers hire college graduates because these workers have demonstrated that they possess basic skills. Whereas colleges would seem to be an expensive employment agency for obtaining workers with basic skills, "if all students left high school with the new basic skills and were able to demonstrate mastery of these skills to employers, the differential between the earnings of high school graduates and college graduates would be much smaller" (Murnane & Levy, 1997, p. 36).

Studies conducted within different educational specializations and in various industry groups support the high priority that employers place on "soft skills." In a 1994 research study conducted in Ontario, Canada, a set of basic workplace skills not based on the SCANS reports was developed and evaluated by employers and program graduates (Murray, 1994). The objective of the study was to determine if the existing college marketing program content and delivery were consistent with the needs of college marketing graduates in order for them to secure employment and perform effectively in the workplace. The researcher found a commonality of thinking in his literature review as to the importance of "soft skills" (Murray, 1994).

To further examine the literature, a series of searches were conducted through the Center for Career and Technical Education, Michigan State University. Literature on key competencies and employability skills for individuals in marketing jobs were reviewed, drawing from the following sources:

"Key Competencies" of the MarED competency data base, Marketing Education Resource Center Inc., Columbus, Ohio, 1989

Student Performance Standards, Parts Marketing, July 1991

Performance Objectives, Hospitality Ontario, Ministry of Skills Development (undated)

Task List – Marketing and Distributive Education (Revised – 1986)

Curriculum Framework, Entrepreneurship, Florida Department of Education, July 1991

Employability Skills: Task List and Profile, Resource Center, Erickson Hall, Michigan State University, April 9, 1993

Each of the above sources had organized their data on skills into three groupings: human relations, conceptual, and technical. The kinds of skills appearing under the human resources grouping were very similar to "soft" skills discussed earlier in the literature review. (pp. 49-50)

Based on all sources reviewed for this study, 60 skills were selected for inclusion in the survey instrument. The instrument was administered to graduates seeking their assessment of importance for employability, and to the graduates' employers, also seeking their assessment of importance of these skills for employability. The study also asked the graduates to assess the degree to which they learned the skills while at college. Findings showed that the human relations skills, as a group, rated higher (mean percentage rating of 82.5) than the other two categories of skills. Human relations skills included, in order of importance:

- positive work attitude
- teamwork
- listening
- honesty & integrity
- demonstrate initiative
- handling pressure & tension
- communication
- concern for others

- interpersonal skills
- courtesy & respect for others
- interest & enthusiasm
- responsible behavior
- self-control
- respect confidentiality
- ethics
- empathy for others
- negotiation
- values & lifestyle
- persuasion
- interviewing skills.

The conceptual skills, as a category, were the next most highly rated (mean percentage rating of 63.5). In order of importance the conceptual skills were:

- decision making
- time management
- problem solving
- set goals & objectives
- identify priorities
- generate business ideas
- learning to learn
- interpret firm's mission
- evaluate competition

- allocate resources
- product/service planning
- identify research need
- evaluate own business unit
- career development
- risk management
- understanding entrepreneurship
- continuing education
- visioning
- planning new business
- manpower planning.

The technical skills were the last category of skills in importance (mean percentage rating of 45.5). In order of importance, the technical skills were:

- develop action plans
- marketing basics
- marketing promotion
- computer applications
- marketing strategy
- market segmentation
- pricing
- public relations
- marketing research
- business systems

- business organizations
- government regulation
- marketing finance
- marketing operations
- purchasing
- marketing distribution
- business mathematics
- business, international trade
- business law.

The data demonstrate that employers value the human relations' skills higher than the conceptual and technical skills. Of some surprise were the graduates' ratings of how thoroughly they learned these skills while in college. Of the three skill groups, the graduates felt that, on average, they learned the human relations skills less thoroughly (mean percentage rating of 40.8) than they learned the other two skill groups (conceptual skills mean percentage rating of 48.0 and technical skills mean percentage of 53.5). This disparity points to three possibilities: (1) the students do not understand the importance of the "soft skills" to employers, and/or (2) educators do not understand the importance of the "soft skills" to employers, and/or (3) educators are not effectively teaching the "soft skills" important to employers (Murray, 1994).

Focusing on the needs of smaller companies, a 1996 study utilized a population sample of 40 small business employers throughout the state of Oklahoma (Harris, 1996). The definition of "small" in this study limited the size of each employer to a maximum of 50 employees. This two-round modified-Delphi study had the respondents rate the SCANS skills and competencies in order of importance on a 10-point Likert-type scale. Although the study did not separate the SCANS skills and competencies into categories, the resulting data clearly show "soft skills" at the top of the rankings (Harris, 1996).

Corroborating the Harris study findings was a similar study conducted in the Tempe-Phoenix, Arizona, metropolitan area (Wilhelm, 1998). The researcher also utilized a series of questionnaires in a modified Delphi study with a broad range of employers in various industries as his respondent sample. The sample consisted of 24 respondents, all hiring personnel from a variety of organizations, industries, and business types and sizes. The study focused on three research questions:

1. What level of importance do employers place on each of the 37 SCANS skills and competencies?

2. What other skills and competencies not covered in the SCANS list are necessary for success in the workplace?

3. What kinds of student-produced "products" would, or could, employers use to assess applicant proficiency in the identified skills and competencies?

Through three rounds of questionnaires, the respondents did not identify any new skills or competencies that they felt should be added to those already contained in the SCANS list. Table 2, SCANS Skills Ratings Comparison: Harris Study (1996) and Wilhelm Study (1998) shows a comparison of the SCANS skills' ratings found in the two studies. Both studies clearly show a preponderance of "soft skills" at the top of the rankings in both studies.

Table 2, SCANS Skills Ratings Comparison: Harris Study vs. Wilhelm Study clearly shows a preponderance of "soft skills" at the top of the ratings for both studies.

Table 2
SCANS Skills Ratings Comparison: Harris Study vs. Wilhelm Study

Harris (1996)		**Wilhelm (1998)**	
Skills	**Mean Scores**	**Mean Scores**	**Skills**
Integrity/honesty	9.24	9.70	Integrity/honesty
Listening	9.21	9.50	Reading
Serves clients/customers	8.77	9.40	Participates a part of a team
Responsibility	8.35	9.30	Responsibility
Participates as a member of a team	8.35	9.30	Works with cultural diversity
Esteem	8.12	9.20	Serves clients & customers
Sociability	8.06	9.10	Listening
Reading	7.97	8.32	Sociability
Time management	7.91	8.30	Speaking
Works with diversity	7.91	8.20	Knowing how to learn
Speaking	7.88	8.00	Arithmetic
Self-management	7.88	7.90	Writing

continued

Harris (1996)		Wilhelm (1998)	
Skills	**Mean Scores**	**Mean Scores**	**Skills**
Interprets and communicates information	7.77	7.89	Self-management
Organizes and maintains information	7.50	7.80	Problem solving
Acquires and uses information	7.47	7.70	Allocates time
Knowing how to learn	7.38	7.50	Self-esteem
Problem solving	7.35	7.30	Decision making
Arithmetic/mathematics	7.06	7.20	Reasoning
Teaches others new skills	7.03	7.10	Creative thinking
Writing	6.94	6.90	Uses computers to process information
Creative thinking	6.94	6.60	Mathematics
Decision-making	6.91	6.60	Interprets/communicates information
Reasoning	6.85	6.30	Acquires & evaluates information
Exercises leadership	6.82	6.30	Organizes/maintains information
Sees things in mind's-eye	6.50	6.10	Exercises leadership
Manages materials and facilities	6.50	6.10	Negotiates to arrive at a decision
Understands systems	6.41	6.10	Understands Systems
Uses computers to process information	6.32	5.90	Teaches others
Negotiates	6.21	4.90	Improves or designs systems
Maintains and troubleshoots equipment	6.03	4.80	Selects technology
Manages human resources	5.88	4.80	Applies technology to tasks
Monitors and corrects performance	5.74	4.60	Allocates human resources
Improves or designs systems	5.62	4.60	Monitors/corrects performance
Manages money	5.56	4.53	Allocates money
Selects technology	4.82	4.50	Seeing things in the mind's-eye
		4.40	Maintains/trouble shoots equipment
		4.20	Allocates materials and facilities

continued

Note: The Wilhelm study (1998) employed a 5 point Likert scale, while the Harris study (1996) employed a 10 point Likert scale. The mean ratings from the 5 point Likert scale were doubled for comparison purposes in this table.
Source: Harris, G. W. (1996). *Identification of the workplace basic skills necessary for effective job performance by entry-level workers in small businesses in Oklahoma*. (Doctoral dissertation, Oklahoma State University), and Wilhelm, W.J. (1998). *A Delphi study of entry-level workplace skills, competencies, and proof-of-achievement products*. (Doctoral dissertation, Arizona State University).

In the Harris study (1996), using similar rating methods, 9 out of the top 12 skills and competencies found in the Wilhelm study (1998) were also found. Integrity/honesty topped the list in both studies. Standard deviations for the top-rated skills and competencies in both studies remained low, indicating substantial respondent agreement. Further, among the lowest rated 12 skills and competencies in the Wilhelm study, fully 8 of the same skills and competencies were found in the Harris study (1996). These tended to be in the categories of resource management and systems and technology skills (Wilhelm, 1998).

An industry-specific study conducted in Missouri in 1996 focused on the skills needed by entry-level and middle-management employees in the hotel/motel industry (Harrison, 1996). The researcher utilized the survey method with a purposive sample of 232 respondents in the hotel/motel industry throughout the state of Missouri. Respondents were asked to rate the importance of specific phrases defining the SCANS skills and competencies. The number of phrases for each SCANS skill category was as follows: interpersonal skills - 6 phrases (items); information skills, - 4 phrases; resource management skills – 4 phrases; systems skills – 3 phrases; and technological skills – 3 phrases. Respondents rated each phrase on a seven-point Likert-type scale. The study showed that respondents rated interpersonal skills highest in both entry-level employees and middle-management employees.

Table 3, Coefficient Alphas for the Five SCANS Domains for Entry Level and Middle-Management Employees, presents the researchers results showing that the interpersonal, or "soft skills," again, receive the highest ratings by employers.

Table 3
Coefficient Alphas for the Five SCANS Domains for Entry-Level and Middle-Management Employees

		Coefficient Alphas	
Skills Domain	Number of Items (phrases)	Entry Level	Middle-Management
Resources	4	.722	.907
Information	4	.713	.830
Interpersonal	6	.842	.922
Systems	3	.749	.866
Technology	3	.677	.795

Source: Harrison, W. J., (May 1996). Workplace basics competencies (SCANS) needed by entry-level and middle-management employees as perceived by hotel/motel managers. Doctoral dissertation, University if Missouri-Columbia.

Another research study based on the SCANS reports utilized the following categories to differentiate the skills and competencies: basic skills, thinking skills, personal qualities, resources, systems and technology, information skills, and interpersonal skills (Bialczyk, 1997). The researcher presented 27 skills and competencies in her survey instrument versus the 37 skills and competencies contained in the SCANS report, electing to consolidate closely related skill definitions into broader skill definitions. The employer population consisted of a broad range of businesses in a variety of industries located in southern Wayne County (Detroit), Michigan. The random sample of 150 employers was surveyed; 68 of which responded to the survey instrument. Among several research questions posed, the ratings of importance of the SCANS-based skills and competencies are presented in Table 4, Importance of Skill Areas (Employers).

Utilizing a Likert-style response scale (1=not important; 2=somewhat important; 3=moderately important; 4=highly important; 5=extremely important), coupled with a neutral point valuation formula (some categories contained more skill items than others), the researcher computed the mean scores, standard deviations, and *t*-values for the employer responses. Table 4 demonstrates that the employer sample rated the interpersonal skills as most important, followed closely by basic skills, personal skills, and thinking skills. Informational skills and systems and technology skills rated a distant 6th and 7th in importance. The researcher determined that the *t*-values obtained on the comparison of the mean scores for basic skills, thinking skills, personal qualities, systems and technology, informational skills, and interpersonal skills were all statistically significant at an alpha level of .05 with 67 degrees of freedom (Bialczyk, 1997).

Table 4
Importance of Skill Areas (Employers)

Skill Area	Number	Mean	SD	Test Statistic	*t*-Value
Interpersonal skills	68	19.96	3.86	15	10.60*
Basic skills	68	19.69	3.81	15	10.15*
Personal skills	68	16.68	2.39	12	16.13*
Thinking skills	68	14.41	3.14	12	6.33*
Resources	68	12.41	3.82	12	.89 (NS)
Informational skills	68	9.76	3.02	9	2.09*
Systems and Technology	68	6.60	1.94	6	2.56*

*p≤.05

Source: Bialczyk, H. C. (1997). A comparison of the perceptions of employers and students on the significance of workplace skills for entry-level employment. Doctoral dissertation, Wayne State University, Detroit, MI.

To better serve the community college students in the state of Maryland, the Office of Institutional Research and Analysis of the Prince George's Community College District, Maryland, published Workforce Skills Needed By Today's Employers, which analyzed several studies and surveys of employers' most valued skills in today's workforce (Clagett, 1997). Among the abilities desired by today's employers were those skills described by Carnevale in *Workplace Basics: The Essential Skills Employers Want*, (Carnevale, Gainer and Meltzer, 1990). Employers reported that the greatest training needs to update employees' skills and productivity, in addition to technical skills, were in interpersonal communications and teamwork, individual responsibility and work habits, basic academic skills, and life skills such as time management, punctuality, and courtesy (Clagett, 1997).

Another 1998 study with a nonexperimental, correlational research design compared the responses of high school principals, high school vocational education directors, and business executives regarding school-to-work skills needed to make a successful transition to either post-secondary education or the workforce (Harvey, 1998). The respondents were from Macomb, Oakland, and Wayne Counties, Michigan. The sample consisted of 40 employers, 35 high school principals, and 28 vocational education directors. Two instruments were used to generate data: The Job Analysis Form, based on 27 job skills organized into seven competency categories derived from SCANS, featuring a five-point Likert-type rating scale of importance (Meeks, 1996), and demographic surveys. The researcher was concerned not only with the overall ratings of importance for the job skills by the three types of respondents; but also if there would be statistically significant differences between the three types of respondents in their ratings; and, among the employer respondents, if there would be statistically significant differences between the types of industry, i.e., service, technical, or manufacturing.

Table 5, One-Way Analysis of Variance: SCANS Skills by Type of Respondent, presents the ratings of the skills themselves.

The findings again demonstrate the importance of the interpersonal "soft skills" in relation to the other SCANS skills, having received the highest ratings after basic skills. The researcher did calculate statistically significant differences between the employer ratings than those of the two educational administrators (principals and vocational education directors). However, these lower employer ratings were throughout all categories of skills, thereby leading one to conclude that employers simply did not give ratings as high as the administrators. By examining the mean values in the table, one can see that employers did, in general, rate each skill category similar in importance to those ratings by the educational administrators, basic skills and interpersonal skills topping the list.

Also of interest in this study was the analysis of variance of employer ratings by type of industry, i.e., service, technical, and manufacturing. The researcher calculated no statistical difference in ratings among industry types on workplace skills. Further, the researcher calculated no statistical difference among the educational administrators' ratings.

The question logically arises as to immutability of identified entry-level workplace skills and competencies. A study designed to provide educators and industry personnel with validated standards for entry level office-related positions utilized a method for this verification called DACUM (Developing A Curriculum) (Szul & Moore, 1999). The DACUM approach uses experts employed in an occupation to determine the "outcomes" for inclusion in the curriculum. The team of experts is guided through a structured series of steps by an independent facilitator. The steps include: (a) committee orientation, (b) review of occupation, (c) identification of duties, (d) identification of specific tasks, (e) review and refinement, (f) sequencing of task and duty statements, and (g) identification of related requirements. "A significant advantage of the DACUM process is the development of curriculum content without academic intervention" (Szul & Moore, 1999). The study involved 15 business leaders representing diverse industries throughout a six-county area in Western Pennsylvania from metropolitan, urban, and rural areas. Also invited were program graduates. An independent facilitator led the panel through the DACUM process, each group reviewing a list of 175 competencies based on the five categories identified by SCANS. An analysis of the review process "showed that 59 percent (103) were to be retained as stated.

Table 5
One-Way Analysis of Variance: SCANS Skills by Type of Respondent

Respondent Type	Number	Mean	SD	DF	F ratio
Basic skills					
Principals	35	22.94	3.55	2/100	8.96*
Voc. Ed. Director	28	22.14	2.84		
Employers	40	19.53	4.21		
Thinking skills					
Principals	35	17.40	3.12	2/100	11.10*
Voc. Ed. Director	28	16.75	3.05		
Employers	40	14.12	3.32		
Personal qualities					
Principals	35	17.94	2.87	2/100	6.99*
Voc. Ed. Director	28	18.11	1.66		
Employers	40	15.98	3.11		
Resources					
Principals	35	15.26	3.06	2/100	15.49*
Voc. Ed. Director	28	14.75	3.18		
Employers	40	11.68	2.82		
Systems and technology					
Principals	35	8.03	1.74	2/100	7.85*
Voc. Ed. Director	28	7.50	1.60		
Employers	40	6.43	1.95		
Informational skills					
Principals	35	12.63	2.87	2/100	7.22*
Voc. Ed. Director	28	11.86	3.03		
Employers	40	10.18	2.74		
Interpersonal skills					
Principals	35	21.71	3.77	2/100	4.82*
Voc. Ed. Director	28	20.00	3.06		
Employers	40	19.13	3.88		

*$p \leq .05$

Source: Harvey, H. C., (1998). A comparison of business and educational leaders' perceptions of necessary competencies and skills needed by high school graduates to successfully obtain and maintain entry-level employment. Doctoral dissertation, Wayne State University, Detroit, MI.

This implies that the remaining 41 percent (72) needed revision or deletion. Twenty-six percent (46) were identified as needed updating," and five percent (8) were combined. "Of greatest interest to the panel and the facilitation team were the 10 percent (18) identified as no longer relevant" (Szul & Moore, 1999, p. 43). This study clearly indicates the need for continuous revision of competencies, standards, and curriculum.

Summary

Stimulated by the scathing indictments of U.S. public schools contained in, and stimulated by *A Nation at Risk* (The National Commission on Excellence in Education, 1983), various study panels and research projects were undertaken to identify the outcomes that should serve as curricular targets for our schools. Because of its far reaching and thorough inclusion of expert opinion and its genesis at the highest levels of government, the series of reports put out by the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS, 1991, 1992) have become the ubiquitous bases for recent studies of entry-level workplace skills and competencies. Many researchers have used SCANS in refined and directed research studies designed to determine specific applicability to differing geographic, demographic, industry, and lifestyle situations. All of the studies reviewed in this chapter have attempted to distill for specific constituencies entry-level workplace skills and competencies that could both assure new employees success in the work force and increase productivity for the organizations for whom they work. Although not of sole importance for successful employment, the skills that consistently emerge as the most critical for successful employment are the "soft skills," those personal competencies and interpersonal skills not of a technical nature. Defined skills and competencies identified as relevant for a particular constituency should not be adhered to in stasis. Constant revisions are necessary to refine the outcomes, define the skills, and update the curricula.

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Chapter 3

Strategies and Resources to Develop Workplace Skills

by
Linda F. Szul

Introduction

Educators are held accountable for students' achievement and struggle to find ways to teach them the knowledge and skills necessary to succeed in the workplace. Stakeholders including parents, government agencies, and employers have challenged our schools to educate students so they are adequately prepared to enter the work force. According to Dittmar (2000), employers want dependable workers who can get along with others and who are willing to learn and keep up with change. The pace of change, however, is getting faster and faster, and workers being trained for the 21st century must make a commitment to lifelong learning. Educators are endeavoring to instill in students a commitment to lifelong learning, a willingness to adapt, as well as higher-level technical and interpersonal skills. Today's students must possess a multitude of increasingly sophisticated skills in order to survive; furthermore, employers want meaningful evidence that students both possess these skills and can use them on the job.

Various educational reform efforts mandate that educational institutions strive to produce the highest quality of student learning. The curriculum, largely because of increased technology and its influences on educational settings, has dramatically changed. Educators are challenged to change the way they demonstrate teaching and learning effectiveness (Hansen & Teeter, 1995). Classroom techniques that both provide students with feedback and help them understand and apply what they have learned must be incorporated into the curriculum. Braathen and Robles (2000), along with Szul and Moore (1999) advocate developing a curriculum that incorporates input from employers, assures job readiness, provides academic competence, and teaches technical as well as soft skills in a meaningful way.

To meet the challenge set by stakeholders, educators must use a variety of strategies and resources to promote competence in all areas, develop a relevant curriculum, clearly identify the needs of employers, and incorporate techniques that foster development of necessary skills, attitudes, and knowledge. This chapter discusses strategies, resources, and curricula that will maximize student learning and develop workplace skills.

Business partners and advisory committees are insisting that education mimic the corporate world so that students gain expertise in problem solving, group processing, and reasoning. Wiggins (1993) includes communications as a component of authenticity and argues for classroom activities which "better replicate authentic challenges and conditions instead of isolated drill exercises and provides an example of how a performance for understanding differs from a test of knowledge" (Wiggins, p. 210). Authentic activities should include higher-order thinking, specific domain knowledge, and emulation of real world activities as well as communication of understanding, mastery, complex holistic activities, and emulation or facilitation of adult performance

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Further, results of a study conducted by Szul and Moore (1999), found that employers are seeking dependable employees who get along with one another, can work as part of a team, communicate effectively, and possess higher order thinking and problem-solving skills. In a survey of four major metropolitan areas in different regions of the country—Atlanta, Boston, Detroit, and Los Angeles—Harry Holzer (in Conrad & Leigh, 1999), an economist at Michigan State University, found that more than 50 percent of entry-level jobs required social and interpersonal skills. A survey conducted in Los Angeles and Detroit by Phillip Moss and Chris Tilly, economists at the University of Massachusetts in Lowell, determined that 86 percent of employers included soft skills among their most important hiring criteria (Conrad & Leigh, 1999). National inventories consistently find that employers list skills in communication, interpersonal relationships, and problem solving along with personal qualities such as self-esteem and motivation as critical for workforce productivity. Wilhelm (1999) also found that employers highly value skills and competencies that require an employee to interact with and relate well with others in the workplace. He also noted that the least important skills were those calling for knowledge of technology and resource management leading to the conclusion that these would be less important to employers when recruiting for entry-level workers.

Soft Skills

Soft skills are defined as nontechnical skills, abilities, and traits required to function in a specific employment environment and can be placed in categories:

- Problem solving and other cognitive skills involve identifying problems and formulating and evaluating alternative solutions by weighing risks and benefits.

- Oral communication skills include the ability to speak well and listen well.

- Personal qualities important to job performance include self-esteem, self-management, responsibility, and motivation.

- Interpersonal and teamwork skills are those needed to negotiate with others, to participate as a member of a team, to serve clients and customers in a way that meets their expectations, and to resolve conflicts maturely (Conrad & Leigh 1999).

These skills are necessary for an individual to deliver information, work effectively as a member of a team, learn or acquire the technical skills necessary to perform a task, inspire the confidence of supervisors and management, and understand and adapt to the cultural norms of the workplace. However, they require a different strategy for both teaching and evaluating. The objective is for the student not only to know something about the skill but also to be able to do the skill and demonstrate it well.

Coaching. The best method for learning soft skills is to practice with an expert coach (teacher) under realistic working conditions until the student has achieved fluency. This method is superior to other methods for teaching soft skills because when you do something repeatedly—trying to perform up to an explicit standard—your mind gets the "feel" of doing it proficiently. The "feel" of doing is the skill. If you don't acquire the feel, you haven't acquired the skill. Coaching the actual performance shortens the time it takes for a student to become proficient enough to achieve the desired result repeatedly. The new behavior eventually becomes the preferred way of behaving.

As educators who accept the responsibility of making students proficient in soft skills, we must ask, "How does one acquire skillfulness?" (Georges, 1996, p 6). The most effective way to acquire skillfulness is a simple, two-step process: Step 1—students are quickly educated about the results they are being asked to achieve and the skills they will have to execute in order to obtain those results. Step 2—they practice with a coach who can cut down trial-and-error time, until they achieve fluency. In the hands of a good teacher, Step 1 takes 5 to 10 percent of the allotted time and Step 2 takes the other 90 to 95 percent. Business educators are naturals for this process because of the practical, hands-on experiences we bring to the classroom. In addition, we have the advantage of working with business advisory councils, attending professional conferences, and working in the field which helps further define the skills and knowledge our students will be required to demonstrate and possess.

To help students master soft skills our classroom must be converted to real working sessions with added coaching. The purpose is to evaluate and make decisions about improving a particular soft skill area—real improvement that will make a difference to the students. To construct this working session, ask students to bring original ideas to class—ideas that meet two criteria. First, students in the class must be capable of implementing the idea or be in contact with someone with decision-making authority. Second, if adopted, the improvement must be measurable. An idea such as, "Let's put vending machines in the cafeteria," is appealing but not easily implemented by the students. One idea that better fits the criteria is, "Yearbook sponsorships are falling; instead of having one student call on a business, let's put together a sales team. This team could increase sponsorships within 30 days."

Give the students a quick overview of the skills that would help them gain the commitment and support they need to implement their idea. Make the explanation succinct and then put everyone on the task of gaining commitment and support from one another. Coach them and have them perform the task over and over again until they are proficient at the skills and have achieved concrete desirable results. One obvious result is that a student gains needed support and approval for a good idea. Another acceptable result is that a student becomes persuaded that his/her idea is not the best and accepts this with no hard feelings.

This approach is the method of martial arts trainers, sports teams, and coaches in the performing arts. It is proven to work. Remember the steps: (a) clearly define the measure of skillfulness required; (b) clearly define the measurable outcome desired; (c) educate quickly and precisely; and (d) train, by using coached repetition, until the measurable performance level and the desired result are consistently achieved.

According to Georges (1996), this formula almost always achieves measurable success, regardless of the skill(s) you are trying to develop: teamwork, problem-solving, or communications. When you have students practice gaining support from one another for real proposals, coach them while they complete the activity. Have them practice and repeat each skill until they can perform fluently with competence and confidence; they will become skillful in soft skills.

Teaching about soft skills without giving students an opportunity to acquire these skills fails to prepare them for the demands of employment. Realistic activities incorporated into the curriculum afford an opportunity to gain workplace readiness, provide stimulating and engaging activities, and engage students in the learning process. The activities require an effort on the part of educators to create and take classroom time to complete. In order to be effective, the activity should incorporate specific soft skill(s) as well as other academic and/or technical skills. As part of an experimental research study, three university faculty teaching business and English education methods classes combined to have their pre-service students create unit plans that included concepts from both English and business education and focused on both soft and technical skills (Szul, Moore & Norris, 1999). The units the students developed can be incorporated into several business classes, depending on the skill level and needs of the students. A brief description of several projects and strategies that can be incorporated into the business education curriculum is provided.

Design and create a Web page. Students design and create a web page for the school. In addition to using technical skills, they have the opportunity to work in a team and communicate with peers and superiors. All stakeholders, including administrators, faculty, peers, parents, and the business community, access the posted Web page thus increasing students' confidence in their abilities.

Career portfolio. Students research job opportunities in a selected field. Then they prepare a cover letter and resume and participate in a mock interview. These activities incorporate skills in researching, writing, editing, speaking, and listening. Next they participate in a luncheon, attended by advisory council members, local business leaders, administrators, and other faculty, that includes a discussion of business dining etiquette and appropriate interview attire. This activity gives students an opportunity to refresh rules of dining etiquette while interacting with potential employers.

Job-shadowing experiences. Students research jobs of interest to them then work with a faculty member to arrange a job-shadowing experience. During the experience, students keep a log of activities and interview the employer as well as other employees. At the conclusion of the experience, students prepare a report and present it to the class. Students are encouraged to use presentation software to complete the oral assignment.

Newsletter. Students work in teams and incorporate writing, reading, and the business aspects of publishing to develop and publish a newsletter. Students are responsible for seeking newsworthy information, composing the articles, and formatting the newsletter. The activity fosters team building and communication skills in addition to English and technical skills. The newsletter is shared with students, faculty, administrators, parents, and other stakeholders.

Senior project. Many states have initiated the senior project as a culmination activity prior to graduation. Students choose a topic of interest, conduct research, and write a paper. They then use the information in the papers to create real-life projects. The variety of topics chosen makes these efforts interdisciplinary. The final phase of the project is a formal presentation before a panel of faculty, peers, and community representatives. Following the presentation, the panel asks the senior questions to evaluate impromptu speaking skills, knowledge level, and poise.

Closure activities. At the end of a unit, students complete several activities to demonstrate mastery of the topic. They write a paper explaining the concept. Next, cooperative groups of students do an artistic representation of a concept.

Then, students demonstrate an understanding of the concept using technology. Finally, with a partner, students prepare a debate demonstrating two sides of a controversial issue.

Station Activities. Students proceed through a series of discrete tasks, either individually or in teams, in a given amount of time. They are asked questions that are open ended and designed to elicit thinking strategies; the responses are given either orally or in writing.

Domain Projects. Students conduct a set of exercises designed to explore an idea, concept, or practice central to a particular academic domain. The exercises require sustained attention in a single work area and are carried out over several in- or out-of-class sessions. They must solve a wide range of problems to set up the criteria and make their judgments (Raizen & Kaser, 1989). Evaluation is based on the demonstration of mastery of a variety of outcomes each with its own performance criteria.

Portfolios. Students combine several projects completed in a sequence to show their progress (growth) within a subject. Portfolios are selected collections of a variety of performance-based work and can include initial plans, drafts, self-evaluations, feedback, and plans for subsequent projects. Students have the opportunity to include their best pieces that illustrate improvements made; they incorporate files, folders, computer disks, and CD-ROMs. Compilation of the portfolio requires synthesis and creative thinking. In addition, portfolios provide an opportunity for students to demonstrate to prospective employers what they have learned.

Videotapes/Observations. Students are required to perform a task while being either videotaped or observed. Performance is evaluated or scored based on a set of predetermined criteria. These techniques are gaining popularity in educational circles.

Interviews. Students are asked verbal questions from the assessor and must respond. The structured interview gives students the opportunity to hone oral communication skills while also allowing the interviewer to collect information about students across different time periods.

Case studies. A case study is used as a teaching strategy to transfer much of the responsibility for learning from the teacher to the student. Through careful examination and discussion of various scenarios, students learn to identify actual problems, to recognize key players and their agendas, and to become aware of those aspects of the situation that contribute to the problem. Students are encouraged to generate their own analysis of the problems under consideration, develop their own solutions, and practically apply their knowledge of theory to these problems. Case discussions can also help students prepare for real-world problems, situations, and crises by providing an approximation of various professional environments without ever having to leave the classroom. This method also incorporates the idea that students can learn from one another by engaging with each other and with each other's ideas, by asserting something and then having it questioned, challenged and thrown back at them so that they can reflect on what they hear, and then refine what they say. Students can direct their own learning by formulating questions and taking responsibility for the study.

Varieties of strategies are available for the classroom teacher to enhance student learning. These strategies have been employed by educators, studied by researchers, and instituted by public school systems. Whatever strategies are employed, employers measure their success as they hire students for internships and/or employment.

Resources

Educators have access to a variety of resources that allow them to maximize student-learning opportunities both in and out of the classroom. The discussion includes classroom resources, business/education partnerships, and professional organizations.

Classroom Resources

Technology. Business educators have a solid foundation in the use of technology, especially media components and computer software. Software packages include a wide variety of tutorials as well as specialized packages designed for classroom management, instructional management, and assessment. Using technology as an instructional tool is a matter of using technology in all courses taught in the business curriculum, regardless of the course content. Through the use of resources including presentation software, multimedia, telecommunications, and the Internet, business educators have the ability to capture and hold the attention of students.

The World Wide Web has made available a variety of resources for educators that help enhance learning. The Web is easy to use, both for finding information and for publishing it electronically; because so much information is available, and because that information can appear to be fairly anonymous, it is necessary to develop skills to evaluate what you find. Carolyn Kotlas (1977) has developed a resource guide that helps sort out the good from the bad, the useful Web sites from the time-wasters; she also includes a checklist of questions to ask when evaluating a Web site as a potential educational resource. Web sites worth exploring include:

1. Microsoft in Education offers a variety of educational resources. The Instructional Resources section provides tutorials, lesson plans, and laptop learning. The site also contains the Classroom Teacher Network where you will find tips in the Classroom Corner, Educational Leadership advice and issues, Teacher Toolkit, and a special section for New Teachers. The Technology Center offers case studies, solutions, and resources on various technological trends in education. Microsoft's site also provides resources on training and certification through the Microsoft Mentor Program and Technical and Office Certifications <www.microsoft.com/education>.

2. The Lesson Plans Page features a variety of subject area resources. Lesson Plans are broken down into subject area and then into grade level. The Computers and Internet section for the junior and senior high level offers plans for applications, e-mail, Internet, technical, and keyboarding lessons. Also provided are ways to connect computers and the Internet to subject areas such as science and music <http://www.lessonplanspage.com>.

3. Teachers.Net provides an assortment of support topics including resources columns, sponsors, and affiliates. The major resources are chat boards, job centers, supplies and lesson plans for a variety of subject areas encompassing all grade levels <www.teachers.net>.

4. Lesson Plan Search offers technology and media as one of its direct categories. The subject is then broken down into 4 grade categories. The High School (9-12) section is the largest and includes 42 different lesson plans directly related to technology and media <www.lessonplansearch.com>.

5. edHelper.com presents lesson plans and resources in a wide variety of subject categories including technology and computers. This site also lists the "Latest Educational Headlines" and a discussion board where teachers can post questions <http://www.edhelper.com>.

6. Kathy Schrock's Guide for Educators is a categorized list of sites useful for enhancing curriculum and professional growth. The teaching tools section contains a quiz center, puzzle maker, and worksheet generator. The lesson plans page allows teachers to search for plans by grade and subject. This site also provides conversations with other teachers through a bulletin board or e-mail exchange <http://school.discovery.com/schrockguide>.

7. The Northwest Regional Education Laboratory's site contains the Library in the Sky teacher resources. The lesson plans provided for advanced technology topics include guides, ways to integrate technology into the classroom, Internet for beginners, and web page design <http://www.nwrel.org/sky/teacher.html>.

8. RubiStar is a tool to help the teacher who wants to use rubrics but does not have the time to develop them from scratch. This site provides generic rubrics that can simply be printed and used for many typical projects and assignments. The unique element is that it provides generic rubrics in a format that can be customized. The teacher can change almost all suggested text in the rubric to fit the project. <http://rubistar.4teachers.org>.

9. Computer User.com offers a link to its high-tech dictionary. The dictionary allows the user to search for a term by starting letter or entire word. With one click, the dictionary will produce a random term from its word bank. This site also provides definitions of new terms, Y2K terms, emoticons, HTML tags, file types, and domains <www.computeruser.com>.

10. Techdictionary.com defines thousands of computer terms and technology words. It allows the user to search by term or keyword. You will also find telecommunications terms, acronyms, smilies or emoticons, chat symbols, filename extensions, HTML tags, and domain suffixes. This site also provides the option to find a random term in the dictionary <www.techdictionary.com>.

Business/Education Partnerships. Business has a long tradition of involvement in education. It offers expertise, shows teachers how to adopt successful business practices, and acts as an ally. Today the nature of the partnership is changing; the most successful partnerships no longer concentrate on specific activities but strive for sustainability and focus on areas related to the competitive changes in the workplace that are driving a learning economy. Glenn (2001) states that partnerships are about strategic workforce development issues and the ability to leverage time, content, and resources to serve educational reform. The National Alliance of Business (NAB), based in Washington, DC, lists 800 organizations that offer a way for teachers to tap into already existing community-based infrastructures. The mission of the NAB is to improve education and training and to provide teachers with an opportunity to access existing community-based coalitions.
Examples of the new breed of partnerships that help teachers bridge the gap between what is being taught and what it takes to be successful include:

> Utility Business Education Coalition (UBEC), headquartered in Reston, Virginia, is a nonprofit organization headed by CEO's formed to produce measurable improvements at the local school district level. It is a coalition of the nation's electric and natural gas utilities that work with local business, community, and education leaders when invited. It emphasizes communication and strategic planning, and formalizes the relationship between local business, community, and education leaders by creating a new, or building on an existing nonprofit organization <www.ubec.org>.

- Cisco Systems, Incorporated, formed the Cisco Networking Academy designed to offer secondary students the same training and industry certification available to colleges and private businesses. This partnership of corporations, government agencies, and non-profit organizations and schools centers on teaching students to design, build, and maintain computer networks. Using WEB technologies, the program prepares students for the 21st century workplace and serves as a model for successful e-learning <www.cisco.com>.

- Bayer Corporation and the Pittsburgh Public Schools formed Making Science Make Sense (MSMS) to promote science literacy, a company-wide program that advances science literacy across the United States through hands-on, inquiry-based science learning, employee volunteerism, and public education. More than 1,000 Bayer employees actively participate in Making Science Make Sense (MSMS) in the communities where they live and work. In addition to the work of these employee volunteers, Bayer supports MSMS with a national public education campaign led by former astronaut, Dr. Mae C. Jemison, who serves as MSMS science literacy advocate. The public education campaign features (1) annual public opinion research with partners, the National Science Foundation and the National Science Teachers Association; (2) the Everyday Science radio program, which is carried by 170 public radio stations; (3) the Bayer/National Science Foundation Award for Community Innovation, a unique science competition for middle school students; and (4) a web site containing up-to-date information about the program and the issues <www.BayerUS.com/msms>.

- Marconi, a Pittsburgh, Pennsylvania, based high technology corporation is developing a series of educational programs that will serve as a model for schools throughout the country. Students study theories pertaining to local area networks and wide area networks by accessing Marconi's Web site. While the information is available to anyone who views the site, students can complete an online test and earn a certificate of completion. The company is also developing a one-year certificate program that allows high school seniors to earn a certificate that may be used as part of their credentials for entering the work force or continuing their education <www.marconi.com>.

- AOL, Kimsey Foundation, Trinity College, and the DC Public School System formed the Education Technology Leadership Institute to train teachers in technology use <aoltimewarnerfoundation.org>.

- Teacher-in-the-workplace is a concept that has been embraced by education and business communities. The two communities come together in partnership to help the students understand the relevance of classroom curricula and to prepare students for the school-to-work transition. Through the program, businesses utilize the skills and expertise of educators to complete projects, conduct research, or begin long-term certification procedures, while providing the educators with "real world" experience to share with their students. This will present them with opportunities to devise lesson plans connecting academics to their work experience.

For business/education partnerships to be successful, they must follow a code of ethics. One such code, developed by the British Columbia Teacher's Federation, can be used as a model for school districts. As Owens (1996) states, the code, "Statement of Ethical Standards for Education/Business Partnerships," is based on a review of similar policies in other jurisdictions in Canada, including a review of the extensive work done by the Conference Board of Canada. The code states:

1. The partnership enhances the quality and relevance of education for learners.

2. The direct and indirect impact of the partnership does not exploit the school or the student for material, ideological, or other advantage, and has a positive impact on a student's school or personal life.

3. The partnership treats students fairly and equitably, including at-risk students and those who have less access to resources from family and community; business partnerships do not reduce corporate obligations to pay their fair share of taxes to support public institutions.

4. The partnership does not increase inequality in the education system and resources derived from partnerships are administered centrally.

5. The partnership provides opportunities for all partners to meet their shared social responsibilities toward education.

6. The partnership is free of stereotyping and discriminatory practices against women, ethnic groups, First Nations people, and members of other groups who have been subject to inequalities.

7. The partnership ensures that corporate logos do not appear in any educational materials or school buildings and grounds.

8. Acknowledgement of each partner's contribution is appropriate, and includes logos or other forms of organizational recognition only if agreed to by the school and its community, including students, staff, and parents.

9. The partnership allocates resources to complement, not replace, public funding for education.

10. The partnership is developed and structured in consultation with all partners and respects the policies, procedures, and traditions operating in the school.

11. The partnership clearly defines roles and responsibilities for all partners and involves individual participants only on a voluntary basis.

12. The partnership does not conflict with teachers' obligations under the BCTF Code of Ethics or provisions of a collective agreement.

13. Partnership performance is evaluated to make informed decisions on continuation of the partnership.

Professional Organizations

Discipline-specific organizations whose membership is open to students and/or educators provide a wealth of opportunities and a variety of activities that enrich and supplement the educational experience. These organizations are open to students in both the secondary and post-secondary environments and provide venues for developing academic as well as soft skills in students. Wills (2000) states organizations provide opportunities for students to apply what they have learned in the classroom and believes instructors should encourage students to participate. Comments from advisors and students participating in various organizations and competitions attest to the value of taking advantage of the numerous opportunities available on all levels.

Distributive Education Clubs of America (DECA) and Delta Epsilon Chi are national associations of marketing education students, that provide teachers and members with educational and leadership development activities to merge with the classroom instructional program. DECA is not extracurricular but an integral part of the classroom instructional program. Chapters attract students who are interested in preparing for entrepreneurial, marketing, or management careers. While DECA membership consists primarily of students in marketing programs, membership extends also to alumni and to professionals in marketing education and in marketing teacher education. Working hand in hand with the education and business communities, its goal is for student members to develop a career success kit to carry into their business and personal lives after graduation. The association provides local marketing educators with a ladder for student success and recognition in 31 different marketing areas. By following the guidelines National DECA has developed for student projects (aligned with the marketing curriculum), students achieve identifiable competencies and can also enter their projects into competition, moving from local to state levels and finally to the national level.

To accomplish this, DECA uses on-the-job experience, chapter projects, and a program of competency-based competitive events in specific marketing occupational areas. These events emphasize academic and vocational excellence as building blocks for successful marketing and management careers and demonstrate the direct relationship between marketing education and the real needs of business and industry. Each year more than 110,000 students participate in the competitions on the local, state and national levels <www.deca.org>.

Delta Epsilon Chi, a national organization for college students preparing for a variety of career areas, places specific emphasis on the areas of marketing, management, U.S. and Canada. Activities promoted by Delta Epsilon Chi integrate with and enhance students' college curriculum. In addition, the organization's close ties with the business community provide both opportunities for members and an appreciation of the free enterprise system.

Delta Epsilon Chi membership is an essential resource for the future professionals that will benefit from marketing, management, and entrepreneurial skills and knowledge. The Competitive Events Program includes a selection of events for nearly 20 career areas. Competitive events recognize student achievement and provide opportunities for traveling to conferences and networking with peers, while testing the knowledge and skills of members (www.delta-hq.org).

Future Business Leaders of America (FBLA) and Phi Beta Lambda (PBL), are nonprofit education associations of students preparing for careers in business and business-related fields. The organization has four divisions: (1) FBLA, for high school students, (2) FBLA Middle Level, for junior high, middle, and intermediate school students, (3) PBL, for postsecondary students, and (4) Professional Alumni Division, for business people, educators, and parents who support its goals. Headquartered in Reston, Virginia, it is organized on local, state, and national levels. Business teachers and advisory councils (including school officials, business people, and community representatives) guide local chapters and coordinate chapter activities for the national organization. Each year, the best and brightest members convene to compete in leadership events, share their successes, and learn new ideas about shaping their career future. FBLA and PBL sponsor conferences and seminars designed to enhance the experience initially developed on the local and state level. They offer a unique chance to build leadership and career skills that last a lifetime and incorporate tracks focusing on entrepreneurship and communication. For the past few years, both FBLA and PBL have enjoyed an annual increase in membership. The high school level has more than 215,000 members, while the postsecondary level reaches over 10,000 college students. The newest group, FBLA Middle Level (grades 5-9) is showing remarkable growth with 8,000 student members and is developing member interest for the high school level <www.fbla-pbl.org>.

Delta Pi Epsilon (DPE) is the national honorary graduate society for professionals who support and promote scholarship, leadership, and cooperation toward the advancement of education for and about business. The organization sponsors annual conferences and publishes a variety of publications for business educators <www.dpe.org>.

Association of Information Technology Professionals (AITP) is the professional association for individuals who seek to expand their potential in information technology. It provides avenues for members to be teachers as well as students and to make contacts with other members in the Information Systems field. The association provides opportunities for professional development and personal growth <www.aitp.org>.

National Business Education Association (NBEA) is the nation's largest professional organization devoted exclusively to serving individuals and groups engaged in instruction, administration, research, and dissemination of information for and about business. NBEA is the leading association devoted to the recognition that business education competencies are essential for all individuals in today's fast-changing society. NBEA provides a link between both the private and public sector and gives business educators an opportunity to stay on top of the changing skills required in today's business world <www.nbea.org>.

Association for Career and Technical Education (ACTE) is the largest national educational association comprised of 13 divisions in 5 geographic regions with more than 38,000 members. ACTE's mission is to provide educational leadership in developing a competitive workforce. It is dedicated to the advancement of education that prepares youth and adults for careers. Each of the 13 divisions represents a specific segment of career and technical education professionals in subject areas ranging from business education to health occupations. Each division is represented on ACTE's board of directors by an elected division president <www.acteonline.org>.

Summary

Educators must meet the challenge mandated by reform efforts to produce the highest quality of student learning. In order to be effective, educational reform must be tied to the development of an enhanced curriculum that incorporates authentic assessment practices.

There is a logical relationship among curriculum, instruction, and assessment. Educators must assess what is taught in order to know the extent to which it has been learned. A curriculum, to be delivered effectively, must be accompanied by appropriate instructional approaches. Authors including Linn (1983) contend that the symmetry between assessment and instruction involves not only the content but also the methods used to teach and assess instructional material. Educators can teach basic information through rote drills and assess learning by using multiple-choice or matching tests; these evaluation instruments rely on recall and recognition of learned information. In the vocational and performance arenas of education, the similarity of curriculum, instruction, and assessment is commonplace.

Research suggests that learning how and where information can be applied should be a central part of all curricular areas (Sweet & Zimmerman, 1992). Students exhibit greater interest in and levels of learning when they are required to organize facts around major concepts and actively construct their own understanding of the concepts in a rich variety of contexts. Students should be encouraged to apply information they have learned and to be engaged in worthwhile learning activities. The best strategies are inherently instructional, actively engaging students in worthwhile learning activities. Students should be encouraged to search out additional information or try different approaches; in addition, these strategies encourage teamwork.

A school's progress in achieving the goals of enhanced student learning and job readiness is always subject to review from all levels. Concentrating on soft skills as well as academic and technical skills and requiring our students to demonstrate learning mastery in a variety of venues will enhance their workplace readiness.

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Chapter 4

21st Century Assessment for the Workplace

by
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Cultural and economic changes in an international environment brought education to the top of the public agenda in the past decade and continue to challenge traditional educational approaches, both in curriculum and assessment. Also, in recent years, research has informed educational practice about how learning takes place and how learning is measured. This chapter gives an overview of assessment issues in the context of student learning and measuring skill proficiency for the workplace, not only in basic academic and technical skills but also in the new workplace basics. Interpersonal relationships, leadership, personal management, adaptability, creative thinking, and problem solving have become an essential, but somewhat intangible, group of skills that are basic to a competitive workforce and educational preparation for a rapidly changing world (Carnevale, Gainer, & Meltzer, 1990; Secretary's Commission on Achieving Necessary Skills [SCANS], 1991).

Traditionally, schools placed emphasis on teaching students how to follow procedures, referred to as algorithms that (when correctly followed) lead to the right answer (Packer, 1998). Workforce preparation centered on teaching observable procedural steps to perform a series of work tasks. As computers and related technologies handle more and more of these routine procedural tasks, the workplace requires adults who generate, test, reject, or modify ideas and procedures. To be competitive in a global, technological, and changing economy, workers must think creatively, solve problems, know how to learn, apply reasoning to abstract situations, and work with others (Giddens & Stasz, 1999). Preparation of students to become competent workers in this environment shifts the emphasis of teaching and assessing from routine procedural tasks to a higher level of thinking and behavior patterns. This paradigm shift in teaching and learning affects all of education—not just career and technical education programs. The main theme of this chapter is how perspectives about what should be taught and what students should be able to do provide new directions for assessment.

Assessment and Testing: How and What Measures?

Assessment, in educational terms, is a test or planned procedure, method, or task used to guide decisions about student learning, curriculum, and instruction (Oatley, 1999). During the last century, assessment of learning consisted primarily of standardized testing that was norm-referenced (Glaser & Silver, 1994; Hatfield

& Gorman, 2000). This type of testing corresponded rather well with instruction that centered on declarative and procedural knowledge. A curriculum that aims to develop and assess higher-level cognitive processes for all students becomes a mismatch for norm-referenced assessment.

Norm-Referenced Tests. Traditionally, assessment served as a proactive and pre-instructional review of student needs to find out what should be taught or retaught (Mundrake, 2000). Objective multiple choice, true-false, matching, and even essay items, covered facts as well as procedural steps that, correctly followed, arrived at a right answer. This simple construction and uniformity of correct response made scoring the tests relatively simple.

A standardized norm-referenced test provides uniform interpretation of scores and enables a comparison of the scores of a test taker or group of test takers with scores of other individuals and groups taking the same test. Standardized tests use uniform procedures for administering and scoring to assure that the results from different people are comparable (Office of Technology Assessment, 1992). Statistically determined norms or reference scores are derived from a given population of test takers. Means, standard deviations, standardized scores, and percentiles are calculated (Glossary of Measurement Terms, 1989). As a result, the norm group of equivalent scores can be used for comparison with individuals and groups taking the test. The underlying assumption of this comparison is that identical scores of different students on the same test represent corresponding performance levels (Bond, 1996).

Norm-referenced tests are primarily used for classifying students. The tests serve a sorting and ranking function that highlights achievement differences between and among students. These assessments evaluate an individual's work by comparing it with that of others (Garcia & Pearson, 1994), resulting in a bell-curve effect with a small percentage of students excelling, a majority rating average, and the rest falling below average.

Standardized test results continue to be used widely as a measure of educational achievement and accountability (Glaser & Silver, 1994). Uses of standardized norm-referenced testing include: (a) comparison of individual student scores for placement decisions; (b) analysis of strengths and weaknesses for decisions about courses of study; and (c) district, school, and teacher accountability for educational effectiveness (Bowers, 1989). However, as workplace and self-sufficiency essential skill requirements changed over the last decade, education reforms reshaped curricula and instructional strategies to achieve newly defined standards of performance. A preponderance of these standards relate to basic core competencies and changing expectations for job success. The new standards-based education brought forth a need to reshape both assessment purposes and assessment methodology.

Valid and Reliable Tests. Validity and reliability are major concerns in test construction, administration, and analysis of results. Test validity is the extent to which a test measures what it is intended to measure (Bowers, 1989). For the most part, validity pertains to content, construct, comparability of results, and the predictive nature of tests (Mundrake, 2000). Validity depends on how well a test measures what is taught and the different domains of cognitive, affective, and psychomotor learning (content validity) and how well the test discriminates among varying levels of difficulty (construct validity). Does it measure what it is intended to measure and are the constructs it measures relevant? (Gratz, 2000). Constructs should be relevant, age-appropriate, and fair. Other validity measures are determined by comparability of a test to other validated tests for the same assessment (concurrent validity) and demonstration of the capability of predicting or comparing future knowledge or performance (predictive validity).

Reliability of an assessment instrument is the capability to measure *consistently* what it is intended to measure (Lambrecht, 2000). Is it also consistent over time when administered on multiple occasions or by different test administrators? Another aspect of test reliability is whether or not it is internally consistent. Do the items in each part of the test measure the same student attribute or knowledge construct? Another type of reliability, inter-rater reliability, means that different persons scoring the same test achieve similar scores. Tests are more likely to be reliable if they have strong validity. The passing score must be valid, and each aspect of test creation and validation should be documented, particularly for high-stakes tests that "significantly determine opportunities and outcomes for test takers" (Gratz, 2000, p. 683).

Normative thinking continues to dominate in this country, as evidenced by a continuing (and even growing) tendency to compare educational performance of schools, districts, states, and even countries. Although high on reliability, content validity of norm-referenced tests has come into question due to their inability to provide a comprehensive, in-depth assessment of knowledge and skills for mastery of subject content actually taught (Bowers, 1989). Because a major part of test validity is the extent to which a test measures what it is intended to measure, content validity calls for evidence that answers affirmatively these questions: Do test items relate sufficiently to what is taught and what is to be measured? Does the result show how well students have learned the knowledge and skills they are expected to master?

The emphasis of norm-referenced tests on recall and replication rather than application of knowledge is incongruent with current expectations and standards for schools and students. The specification of standards for school and workplace skills includes thinking processes that apply subject knowledge and go beyond what can be measured by norm-referenced standardized tests. Norm-referenced tests are ill suited to measure affective skills or complex knowledge and understanding. Decision making, problem solving, creative thinking, and interpersonal skills do not lend themselves to test items constructed to have only one right answer. Standardizing test scores becomes difficult at best when test items can yield a variety of right answers in attempting to measure thinking processes and performance behaviors.

Criterion-Referenced Tests. Criterion-referenced tests are another major type of assessment. A criterion-referenced test measures achievement against a standard or criterion of performance rather than against the performance of others (Glossary of Measurement Terms, 1989). Criterion-referenced tests show what test takers know and can do, not how they compare to others (Anastasi, 1988). Results from these tests give decision makers information about how well students are learning curriculum content and mastering competency standards.

Philosophically, criterion-referenced testing matches the belief that all students can achieve a mastery level of performance and that the test content reflects outcomes that are valued for learning and teaching. Content for a criterion-referenced test comes from its significance in the curriculum; whereas, norm-referenced test items depend on how well they sample a wide-range of basic content and how well they discriminate among students for sorting purposes.

The greatest difficulty with criterion-referenced testing is agreement on the criteria—that is, the decision about the standards of performance deemed sufficient for knowledge mastery or level of that performance. Criteria for program or course objectives generally are based on what a typical student is able to do at a given point in an educational sequence (Lambrecht, 2000). Criteria for job proficiency come from incumbent workers or employers in the occupation who verify knowledge, skills, and attitudes for successful job performance. In the development of criteria for criterion-referenced assessments, there is always a judgment—albeit made by a group of professionals in the field of study—about exemplary and reasonable expectations.

The difficulty of selecting appropriate criteria to assess task performance of higher-order thinking and decision making mirrors the complexity and lack of specificity of the task. Meeting a standard stated as "produce a letter with word processing software" is less complex and easier to assess than a less specific and more complex competency such as "acquire and use information." The standards-based education movement, a more complex and broader vision of competency-based education and mastery learning, brings with it a demand for assessment tools that can describe cognitive accounts of human performance for complex processes such as critical thinking, interpersonal skills, and problem solving (Glaser & Silver, 1994).

Standards-Based Education

Education reform of the 1990s made standards-based education the central core of instructional design. Standards define what students need to know and be able to do; and, therefore, achievement of these standards becomes the measure not only of student success but also of how well schools perform. Standards define learning that has value for success in living and earning a living. The learning goal is no longer students competing against one another but rather one of all students mastering the standards (Gray, 1993).

Standards-based education has two primary purposes: (a) to keep America competitive and (b) to reduce the disparity between high- and low-achieving students (Gratz, 2000). The premise is that all students can live up to high expectations, and most will. However, education reform couples this premise with a belief that students and schools need an incentive to achieve higher levels of performance—and, thus, accountability systems with high-stakes consequences. Proponents of standards-based education agree that standards should be grounded in core academic disciplines, cover what students should know and be able to do, address only the essentials, and compare students with rigorous agreed-upon standards, not with one another.

Designing instruction around standards of performance is not new to career and technical educators. Occupational preparation programs have a long history of designing curriculum around workplace competencies. Is standards-based education just a renaming of competency-based education? A quick look at the meaning of these terms and classroom practices can lead to that conclusion; however, upon closer examination, differences appear. Certainly, the two are similar and, at times, are used interchangeably. Identification of competencies or standards takes place prior to curriculum development and becomes the basis for what is taught and what is tested. Both concepts are statements that define what students need to know and be able to do and are shared with students as learning objectives. It is in the details, however, that the difference becomes apparent.

Competencies that define performance of job tasks are derived through job analysis and interviews with incumbent workers. The term *standard* in the job context means the standard of performance, or how well the task must be performed. Competency-based vocational education stated performance criteria in behavioral terms—that is, what is measured is what can be observed. Behavior is what we do, and the assumption has been that what we do can be observed and what can be observed can be measured. The technical aspects of job tasks lend themselves to procedural specificity. Performance of job tasks can be observed; therefore, competency-based education defined and measured linear steps in completing these tasks. Defining, describing, and measuring less tangible behavior such as affective learning (changes related to feelings, emotions, and values) or thinking processes present greater challenges. Changes in behavior in the affective domain and complex thought cannot be directly observed and uniformly interpreted; therefore, confirmation that learning occurred requires observation of multiple indirect indicators.

Educational standards for schools today are much broader and more general in nature than the competency statements previously used in job preparation programs. Even job knowledge and skills are more broadly defined. As a consequence, assessment and accountability are more complex than previous assessment practices for competency-based vocational education. Concepts such as critical thinking, problem solving, and collaboration are difficult to define in specific terms and, therefore, difficult to measure. These "new basics" of education and the workplace are intangible and, thus, require specification of multiple indicators or demonstrators as indirect evidence that standards or competencies are met.

The term *indicator*, as used in this chapter and in standards-based education, refers to brief statements that represent attributes or characteristics of an educational standard or competency. For example, one of the five competencies identified as essential for high-performance employees is "acquires and uses information" (SCANS, 1991, p. xvii). Statements or indicators that describe this competency are: (a) acquires and evaluates information, (b) organizes and maintains information, (c) interprets and communicates information, and (d) uses computers to process information. Assessment of the competency "acquires and uses information" incorporates complex cognitive processes, not directly observable, that are context specific to the individual and to the situation in which the information is used. Standards-based education uses indicator statements to further describe criteria as a basis for professional judgment about standard mastery or progress toward a standard benchmark for measuring mastery. Because of the varied situations for acquiring and using information, we cannot directly assess accomplishment of the standard. Rather, assessment would include a representative sample of meaningful test items designed to demonstrate multiple indicators of the standard.

Selection of representative indicators and the number and type of assessment items must be based on professional judgment, as well as test statistics. Furthermore, indicators for a standard require the student to make decisions and solve problems and, therefore, assess not only the result but also cognitive processes that cannot be directly observed. The final response is observable, but more than one response can meet the criteria. Students may apply different knowledge and mental processes to reach acceptable solutions, thereby, further complicating assessment.

An example of a measurable task for "interprets and communicates information" (SCANS, 1991, xvii) could be a scenario that gives a description of a work setting, along with a policy directive to be communicated to employees in that setting. Criteria for performance of the task could define unacceptable, acceptable, high, and exemplary performance. To successfully perform this task, the student must interpret a policy directive accurately and communicate it in the manner that best addresses the needs of the audience. In addition to the tangible product that the student produces, the teacher must assess understanding and interpretation of knowledge, both of which are essential elements of decision making for performance of the task. Knowing more about the thinking and rationale for what was done gives the teacher clues about a student's ability to perform similar tasks in a variety of contexts; i.e., transfer of learning. Assessing thinking and rationale could come from asking a student to reflect on what was done and the concepts and thought processes that guided task completion. Interviewing the student at the conclusion of the performance task or having the student describe the reflection in writing obtains such information. Results from a student's written reflection or oral interview help plan instructional strategies for advancing student achievement as well as measuring performance.

Indicators serve as key attributes or characteristics to help evaluators select evaluation data and multiple assessment formats that communicate progress toward achieving standards or outcomes. In one sense, indicators are the vital signs of the status of educational achievement (Hafner & Buchanan, 1992; Jones & Nielsen, 1994; Levesque, Bradby, & Rossi, 1996). They identify checkpoints for monitoring attainment of standards (Nuttall, 1994; Selden, 1994). When translated as specific data, information, or observations, indicators become assessment tools.

Decisions about what is measured and how, as well as satisfactory performance levels, are difficult issues and subject to ambiguity and uncertainty. This is not to say that standards-based education is an impossible dream or that workplace requirements for thinking, problem solving, and interpersonal skills cannot be taught or assessed but, rather, to call attention to the complexity of teaching and assessing student preparation for success in an increasingly complex society and workplace.

Assessment Perspectives

Assessment that has the purpose of measuring and planning for learning is formative assessment. Measuring results to provide a snapshot of achievement at a particular time is summative in purpose. Lambrecht (2000) makes a distinction between formative and summative by purpose and timing. Formative assessment is ongoing and checks to see if intermediate objectives are met for the purpose of improving instructional strategies and student learning. Summative assessment takes place at the end of a major block of instruction or at some other major decision point for the purpose of determining if achievement meets a standard. Another way to consider the distinction between these purposes is to think of formative assessment as having a short-term purpose to enhance the learning process. Assessment for a long-term purpose is more likely to be summative or to include elements that are both summative and formative.

Formative assessment means setting clear goals, developing appropriate learning tasks, assessing, and giving formative feedback to guide learning. Feedback must be used if assessment is formative (Sadler, 1989). The context of the feedback, the associated learning opportunities, and the broader context of students' assumptions about the feedback determine its effectiveness. Too often assessment for grading is overemphasized while assessment for learning is underemphasized. Assessment becomes meaningful when the learner recognizes that a gap exists between his or her present state of knowledge, understanding, or skill and a desired goal. Learning occurs with action that is taken to close that gap.

Assessment must emphasize the skills, knowledge, and attitudes perceived to be most important. Wiggins (1993) reminds us that, in real life, intellect and acquired knowledge and skills are used in particular contexts to solve particular problems. Context matters. Knowing how to adapt knowledge, procedures, and abstract concepts is important for understanding. Solving problems in relevant life situations gives authenticity to learning and assessing. Authentic assessment uses questions of importance that are representative of real-world contexts; are nonroutine; and have multiple formats that assess multifaceted knowledge, judgment, and skill. Students should know how to prepare for assessment because achievement criteria are shared, they should have an opportunity to justify choices for their responses, and they should be exposed to response-contingent items that allow concurrent feedback and self-adjustment during the test. Further, trained assessor judgment should be based on clear and appropriate criteria. Assessment should be subject to oversight or audit and show a response pattern in diverse settings that confirms the students' consistency of habits of mind in performance.

Wiggins (1993) also speaks of contextual fidelity of assessment, meaning that constraints placed on performance by demands of mass educational testing are reasonable. These constraints may be demands placed on us by others, limits on time available, limits on resources, and limits on students' ability to get feedback as they work through the assessment. Again, professional judgment must balance authenticity with appropriate limits.

Principles that guide assessment design pertain to their accuracy and usability for intended purposes (Logan, 1997):

> Assessments should be tied closely to the curriculum. They should have content validity and be used to reflect, enhance, and extend instructional experiences.

- Assessments should provide measures of progress toward meeting clearly defined standards and should produce reliable information about learning over time.

- Results of assessment should be easily conveyed to the various audiences that use them. Assessment results should, first of all, be easy for learners to understand. Regardless of the audience, scoring reports should be easily produced and understood.

- Assessments should not cost more than they are worth. Assessments cost more than direct expenditure of dollars for testing. Time of the learners and the instructor should be well used. If an assessment does not inform instruction, it is probably not worth using.

Criterion-referenced tests are better aligned conceptually to standards-based education than are norm-referenced tests (Lambrecht, 2000). Measurement of individual progress toward an expected standard of performance provides information that informs instructional practices for improving student achievement. However, much work remains to develop assessment tools that have curriculum content validity, can serve a formative purpose, merge results from cognitive research with assessment components, and provide consistent results for accountability. The following section summarizes research results that have influenced a change in the purposes and perceptions of assessment.

Research Implications

Behaviorist theory that underpinned early efforts for competency-based education assumed linear operational learning that could be broken into tasks consisting of process steps or parts and tested accordingly. Research on how the brain functions found learning to be integrated rather than linear. Recent brain research suggests a complex recognition of context and cognitive process as part of developmental learning. This integrated pattern of learning is inconsistent with behavioral theories of linear knowledge acquisition. Behavioral objectives cannot adequately describe complex processes of thought, reasoning, and problem solving (Glaser & Silver, 1994).

Current directions in assessment are based on an extensive body of research that is grounded in cognitive psychology and cognitive development. This research looked at conditions fostering competency acquisition, self-explanation, and strategies for comprehension (Brown & Palinscar, 1989; Chi, Bassock, Lewis, Reimann, & Glaser, 1989; Cote, Goldman, & Saul, 1998; Goldman, 1997). Glaser (1991) described the development of proficient performance as coherent, principled, useful, and goal-oriented knowledge.

Wiggins and McTighe (1998, p.64) describe this higher-order knowledge as understanding that has six facets—"explanation, interpretation, application, perspective, empathy, and self-knowledge." Empathy means a depth of understanding demonstrated as the ability to sensitively perceive. Descriptive indicators that serve as criteria for this perceptive understanding could be the ability to:

- Project self into and appreciate another person's situation or point of view.
- Operate on the assumption that even an apparently odd or obscure comment, text, person, or set of ideas may contain insights that justify further work to understand it.
- See when incomplete or flawed views are plausible, even insightful, though perhaps somewhat incorrect or outdated.
- See and explain possible misunderstandings that others may have about an idea or theory.
- Listen—and hear what others often do not.

For each facet of understanding, the next step is to decide what evidence measures degrees of understanding and where such evidence can be found (Wiggins & McTighe, 1998). What criteria can be used to judge the evidence? Answers to these questions result in rubrics that state understanding as a matter of degree on a continuum rather than right versus wrong.

Emerging Assessment Formats

Research on complex cognitive performance brought a changing perception of assessment. A philosophic emphasis on educational achievement by all students moves the purpose of assessment away from the idea of sorting students to one of gathering data that can describe progress for learning development. This concept de-emphasizes standardized norm-referenced assessment because of its mismatch with standards-based curriculum and its inability to display complex learning performance. Defining content standards and using curriculum-relevant and criterion-based tests to evaluate whether the curriculum has been learned improves achievement for all students, including those with less advantaged backgrounds (Hirsch, 2000).

A variety of assessment formats continue to emerge in an attempt to address the cognitive perspective on thinking, reasoning, and problem solving in subject-content learning applications. With a goal to influence instructional practice, development of test content includes the multiple perspectives of teachers and subject-matter specialists, along with cognitive psychologists and measurement specialists (Pellegrino, Baxter, & Glaser, 1999). Construction of assessment tools consists of open-ended prompts or exercises that require students to write explanations, carry out procedures, design investigations, or reason with targeted subject matter. Multilevel criteria and scoring rubrics value procedures, strategies, and quality of response over right or wrong scoring.

In the search for tests that give a comprehensive assessment of student understanding, a number of alternative assessments are being developed (Bowers, 1989). These alternatives follow the concept of criterion-referenced or performance assessment. Assessment of conceptual understanding and demonstration of complex thought processes take a number of formats and can be applied in a myriad of learning contexts, both within the school and in the external community.

Performance Tasks. In a society in which workers are likely to change careers several times during their work years, in which mobility is increasing and adaptability is constant, a different kind of thought and information processing is critical (Eisner, 1999). Meaning matters in education and cannot be imparted directly from teacher to student. Students must construe meaning from instruction. These changes in desired student outcomes and instructional practices mean that test scores should be not only predictive of how students perform in school but also of how they address tasks beyond the classroom. Performance assessment is one means of examining how students perform tasks and can be defined as a test that demonstrates what students can do with the collective skills and knowledge required for performance of a task (Oatley, 1999).

Performance tasks may take the form of problem-solving demonstrations or construction of a product. Common features of performance assessment involve student construction rather than selection of a response, direct observation of student behavior in task performance, and student reflection of learning and thought processes as well as results (Office of Technology Assessment, 1992). Reflection on results is based on clearly stated and openly communicated evaluation criteria that describe an exemplary performance (Scarloss & Schultz, 1999).

Authentic performance assessment requires students to actively apply what they know to meaningful, real-life tasks. Authentic assessment motivates, aims for in-depth understanding, and assesses the extent to which understanding has occurred. Consider an example of writing to communicate to different audiences for a variety of purposes. After learning and practicing different writing modes, the first formative assessment may be to write a specific type of communication based on specific performance criteria. For assessment of a deeper understanding of written communication, students are given a business communication scenario and asked to determine the purpose and the audience and to prepare a written communication that accomplishes this purpose. For further assessment, students may be asked to reflect on their work and asked for a self-assessment that compares their work to identified criteria for the writing mode that they selected (Krizan & Logan, 2000).

Frequent assessment and feedback, along with self-evaluative reflection, contribute to student achievement (Fredricksen & White, 1997; Fuchs & Fuchs, 1986). Assessment feedback that emphasizes learning benefits is more effective and increases understanding more than assessment that emphasizes performance for grades or test scores. Also, student self-assessment skills are essential to learning (Zessoules & Gardner, 1991). One way to help students build self-evaluative skills is to provide completed examples of exemplary work. Reading and discussing a variety of examples and critiquing one another's work develops evaluative and reflective skills.

Authenticity of performance tasks means that they are similar to activities encountered in the real world and are valuable for purposes other than for school assessment (Gong & Ochs, 1992). An authentic performance task is realistic in terms of who it is done for (audience and context), what it involves (conditions and constraints), what happens or is affected by the performance (consequences), and why the task is important (motivation).

> The following task description might be used as an authentic culminating cooperative group task in a marketing course:
> You are a member of a publishing company that is designing and producing a magazine geared toward the interests of middle school students. The task of your company is to research the interests, get approval for the publication, and staff the magazine. To do this you will need to design a needs assessment survey and poll the student body at your school to discern their interest level. Write a summary of your findings. Based on the results of your survey, plan a presentation for the principal and assistant principals of your school to persuade them to support your magazine idea. Your proposal should be in an oral, written, and visual format. Upon approval from your administration, divide yourself into interest area groups. Each group will write job descriptions and qualifications for each position to be held. Each group will devise and implement a selection process and assign tasks to produce the magazine. (Gong & Ochs, 1992)

Portfolios. Portfolios are a powerful assessment tool to foster student participation and responsibility (Bailey & McTighe, 1996). Students present actual samples of work as evidence of their achievement. This work is systematically collected over time and documents progress as well as communicates what and how well students are learning. However, portfolios are a challenge for teachers with a large number of students because of the time required. Teacher dialogue with individual students about the portfolio is important for maintaining a quality portfolio. Guided reflection questions help students consider specific aspects of their work. They may be asked to find work that fits categories such as how their writing has changed, work that was challenging, their best work, or work they enjoyed the most. A portfolio of student work selected by the student generally includes the student's reflection that explains the selection (Mills, 1996). This student review and selection demonstrates self-analysis relative to internalized standards.

Open-ended Questions. Open-ended questions allow students to show their thinking and apply what they know. Many different successful answers are possible. Student support of the answer is crucial. Drawings, graphs, or diagrams may be part of a response, and responses may emerge from group work. Open does not mean anything goes. Information must be accurate, claims must be supported, reasoning may show logic, and elaboration and intellectual depth. Open-ended questions consist of a prompt that explains the situation or background and gives directions for the actual task. Structure may include visuals, give direction for expectations of the response, and be multipart. Questions may: (a) ask for analysis of what is, is not, ought to be, or is implied; (b) compare and contrast similarities and differences of parallel components; (c) require a description that compiles, organizes, and explains; (d) evaluate by making a value judgment based on data that clarifies issues; or (e) solve problems through problem recognition, information synthesis, generalizations, and interpretation.

Effectiveness of Standards-Based Assessment

Standards-based assessment fits a criterion-referenced approach that measures a student's performance against a criterion level to reflect mastery of the skills assessed (Bowers, 1989). These assessments have high-face validity because of their focus on complex, meaningful tasks and alignment with goals of instruction (Linn, Baker, & Dunbar, 1991). Face validity is not a technical validation of tests. The term refers not to what the test actually measures but to what it appears to measure. It affects acceptance and motivation and can influence results (Lambrecht, 2000). Problems, projects, or products that engage students hold their interest and motivate them to do well.

Performance assessment moves away from testing for a single correct answer to one that requires students to create evidence through performance to demonstrate what they know and can do that is predictive of what they can do beyond the classroom (Eisner, 1999). Considerations for developing or selecting an assessment format are how well it contributes to one or more valued outcomes and its potential to enable a variety of correct responses. In addition, assessment should require thinking skills for integrating knowledge, skills, and judgment in an authentic or real-world situation that actively involves the students with data, materials, or other people, and that produces a meaningful task outcome. In addition, resources for performing the task must be accessible.

Validity and reliability are an issue with performance assessment. The fact that we understand things in context and that not all contexts can be tested makes testing against criteria a sampling procedure. With criterion sampling, these questions should be considered: Is the performance domain sampled fairly and comprehensively? Would different prompts or different kinds of tasks produce different results? Is there sufficient evidence gathered through diverse forms and settings to identify a pattern of responses that indicate competence? Elliott (1996) describes assessment validity as dependent on the degree to which empirical evidence and logical analysis supports the interpretations and uses of results.

Assessment Implications of Workforce Soft Skills

In summation, soft skills for the workplace require critical thinking and interpersonal skills that are applicable to many different work contexts. The increasing importance of these occupational skills parallels, in many ways, the 1990s redesign of curriculum and assessment for K-12 education that places emphasis on higher-order thinking and skills for continued learning throughout life. From a work perspective, employees must be intelligent and adaptable learners, problem solvers, communicators, and team collaborators. Work skills are multidimensional (Giddens & Stasz, 1999). Work performance takes place in a specific work culture or community of practice and requires a combination of knowledge, abilities, behaviors, and values. What does this mean for assessment? Collaboration of career and technical educators with academic educators becomes critical to support of instruction and assessment practices that integrate academic and technical skills, technology proficiency, and the cognitive and interpersonal skills required of employees. The need for this collaboration is underscored by research on learning and assessment that suggests benefits for both teaching and learning with an integrated approach. Christ (1995) observed that presenting information in a meaningful context increases the likelihood that students will retain the information over the long term and that they will make natural connections with work. In high schools, too often, these ways of learning have been reserved for vocational education courses, cooperative education, or other work-based learning (Stern & Rahn, 1995). Work-based learning is part of new models of career-related education. Unlike cooperative education or school-based enterprises tied to career and technical classes, the new programs also relate students' work experience to math, English, science, and social studies. Reflection is an integral part of work-based learning. Assessment that includes writing and discussing what they see in the workplace reveals students' preconceptions and understandings and can guide the design of individualized learning strategies with real-world problems.

Anderson-Yates (1996) suggests evaluation strategies for feedback and assessment of workplace skills. These strategies include making students aware of their progress; using observational checklists, role plays, and simulations for affective behavior; recording and recognizing critical incidents that demonstrate professional behavior in workplace skills; and providing practice in self-evaluation that monitors their own performance and reflects and critiques how they did. An employability portfolio can document learning over time and reinforce the idea that learning is a lifelong process.

Academic demands of jobs require employees to observe and assess situations from an educated perspective and to reason from facts, tests, and measurements (Giddens & Stasz, 1999). The relationship between academic knowledge and work context is complex. New curricular frameworks that "blur the lines" between academic and career and technical education, as well as between teaching and testing, hold promise for the preparation of graduates who can meet emerging workplace challenges. Instruction and assessment simulating complex tasks performed by practitioners in the field plus long-term projects situated in specific work contexts will make business and education partnerships even more important than before. These partnerships are critical to addressing common educational concerns (Gorman, 1999).

As changes continue to emerge in education and work, instructional methods and assessment must continue their metamorphosis in design and structure to address complexity. Student-centered learning models that integrate higher thinking skills places the focus on student learning methods rather than teaching methods. More than likely, educational and workplace response to rapid change and technology advances will require more just-in-time learning (flexible and continuous learning) and flexible instructional delivery using distance education or a combination of innovative learning media. These changes and others, yet to be seen, will present new challenges for appropriate assessment instruments and procedures for quality assurance. Contextualized and student-centered learning suggest that we examine our assumption that everyone should be tested on the same things (Anderson-Yates, 1996).

Criterion-referenced assessment such as performance tasks, open-ended response questions, journals, portfolios, videos, and other authentic assessment methods are more appropriate measures than norm-referenced tests for standards that define complex, inter-related knowledge and knowledge applications. These assessment measures should closely align with instruction and, thus, reflect what is taught. Also, short-term formative assessment for learning development should be consistent with long-term summative assessment of workplace proficiency standards. This authentic assessment of cognitive, interpersonal, and performance tasks in real-world contexts requires that career and technical educators forge strong linkages both with other educators and with employers.

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